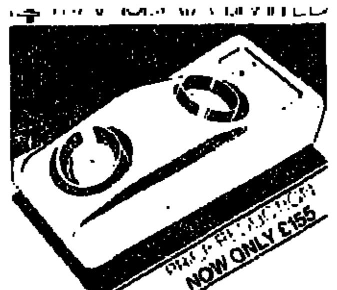
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# ComputerWeekly

Thursday, August 18, 1983



PT7 cuts costs

FERRANTI
Computer Systems

*BLECHNER . . . . . Policy of growth by purchase.*

## Rising Star makes a million

by Kevin Cabill

AMID reports of a major software acquisition, Star Computers has passed the £1 million mark in pre-tax profits.

Figures from the company, based in the East End of London, show that profits rose to £1,070,000 before tax for the year ended April 30, against £822,000 for the previous year.

David Blechner, the Star Group managing director, notes that the former Australian computer group Hartley, which Star acquired last year, has moved into profit.

The UK end of Hartley, which had a user base of over 400, came on to the market after a cash flow crisis wiped out the parent company, which was Australia's only computer producer.

The demise of Hartley caused a major industry/political row in the Antipodes with accusations against banks and government over failure to support the company.

The Australians' bad luck has however, played a significant part in improving turnover at Star by 52% to £6.1 million from last year's £4.04 million.

Blechner and joint managing director Jack Schumann acquired Hartley, principally for shares, and the Star Group's cash position remains strong.

Star has been able to increase its R&D activities significantly.

During the year the company acquired a peripherals distributor, and the projected acquisition, thought to be a software house, continues a policy of growth by purchase which Blechner gave as his principal reason for taking Star on to the Stock Market last year.

The target this time is thought to be software house Tabs.

### 'We've fallen flat on our face' says ITCS boss

# Creditors queue at micro maker

by John Riley

UK microcomputer manufacturer ITCS is in deep financial trouble. Last March the company announced a £500,000 cash injection, a £10 million Middle East order, and a new factory in Ashford, Middx, to manufacture micros in its Andromeda range. Now the factory is depleted, most of its workforce laid off, and creditors from across the computer industry are queueing up for money allegedly owed to them.

Just two months ago ITCS announced a new portable microcomputer the Andromeda Zita E, which it claimed would be in production by September. But even then suppliers were suspending shipments for alleged non-payment.

Nevin Development Systems, which supplied the drive boards for the display and which says it is still owed £11,000, is one. "It was obvious they weren't manufacturing the goods for which we were suppliers so we suspended shipments," said Nevin marketing manager Neil Barker.

Peerless Foam Mouldings, which supplies cabinets for 40% of UK computer manufacturers, says it is owed £7,000 and put ITCS on "permanent stop" some time ago.

Among the other creditors are about 20 of the workforce whose wages have not been paid, the equipment service case supplier Schroff which says is owed about £9,000, the main board supplier Rade Systems which says it is owed £25,000 and software house Tamsys which is owed "an amount we would prefer not to lose".

The Fraud Squad of the Metropolitan Police has confirmed that it has received a letter about ITCS.

David Simon, managing director of Rade Systems, is co-ordinating legal action by the creditors and has employed a solicitor who specialises in computer cases to bring about a winding-up of ITCS by the creditors to by-pass the expense of claiming via the judicial process. "If people don't act this sort of thing will happen time and time again. I invite all creditors who want to join me to contact me on 01-451 4414."

Reubin Josephs, group chairman of Nevin Electrical, said: "I saw little point in spending money chasing the debt because ITCS' premises are gutted, but I would join in with Rade."

"We've fallen flat on our face", admitted David Lewis-Pryce, managing director of ITCS last week. He claimed that there would be "no outstanding debts."

He blamed the lack of success on individuals within the company, and said he planned to continue producing the micros using sub-contractors.

The only other senior manager left in ITCS, sales manager Mike Hoile, said last week that the company was trying to raise about £100,000. He blamed the problems in the company on "unpalatable penalties" imposed by financiers.

Lewis-Pryce claims that there is a distinction between Information and Technology Computer Services Ltd and ITCS Ltd, the former being the manufacturing arm, which has hit trouble, and the latter the marketing arm which is still viable.

Last February, Lewis-Pryce announced a £10 million export order to the Middle East for his Andromeda series of micros. About 500 machines were to go to leading Saudi Arabia distribution company YBA Kanoo, and the deal was welcomed by John Butcher, Junior Minister at the Department of Industry, who said the Andromeda could be expected to achieve significant worldwide sales.

A spokesman for Key Information Technology of Dubai, which handles computers for YBA Kanoo, confirmed there had been an order but said it had not been for £10 million, and the company had not yet received any microcomputers.

There are reports from two sources who believe that ITCS has received a substantial government grant, but the Department of Industry had no comment to make on this.

*LEWIS-PRYCE . . . "There will be no outstanding debts".*

## Council workers black computer supremo

by John Riley

WORKERS at Greenwich Borough Council have blacked their new computer boss, Frank Reeves.

Members of two trade unions are not allowed to work with him and telephonists will not route calls to him.

Reeves' newly created position of director of data and information processing has not been recognised by either the National and Local Government Officers Association (Nalgo) or by the Association of Clerical, Technical and Supervisory Staff (ACTSS) since it was established on May 3.

The unions argue they have not been consulted about re-organisation, while the council argues that the re-organisation has not yet taken place.

"The specific dispute is that the Council re-organised its computer facilities with a new department and head without going through the normal consultative procedures with the unions," claimed a Nalgo spokesman.

The council wants a blueprint for the re-organisation to be decided by the specialist who is going to run it and then have the consultation.

"We need a senior person to plan what we're going to do," explained a council spokesman, "so we adopted normal procedures and made an appointment."

The re-organisation is necessary to replace antiquated equipment left over from when the Greenwich-based London Boroughs Joint Computer Consortium was disbanded about three years ago.

The unions are demanding that the job is re-advertised, and that the council consults them over the new structure of the department. The separate issue of making a new technology agreement guaranteeing no overall job loss has also figured in the dispute.

## Osborne relies on revival

by George Black

ADAM OSBORNE, British expatriate pioneer of the portable, has dismissed suggestions that his business is on the rocks.

He admitted that the Osborne 1 had not been well designed for mass manufacture and that demand for that machine was now small. But he insisted that the newer Executive model would be produced far more efficiently and he expected demand for it to pick up in the autumn.

He blamed his own ignorance for errors in production planning of the Osborne 1. Last week he was forced to shut down his New Jersey plant, laying off 100 people, concentrating output at the Californian factory where 450 are employed.

"It was taking 2½-3 hours to make a machine with only a 50-60% yield on the production line," said Osborne. "We had 300 people employed in manufacturing, which was far too many."

Customer service had also been conducted absurdly, he admitted. "We had 60 to 70 people just answering telephones on dealers' and users' inquiries. Our competitors just don't do such things. We must bite the bullet and quit doing that. You don't call Sony in Japan when your stereo turntable develops a fault."

The Executive would take about a third of the time of the model 1 to build, about one an hour, he claimed: and it would have a 90% production yield. The Osborne 1 would not be dropped completely, but would get only about one week in four of the production time in California.

He did not anticipate having to cut his labour force below its present level for the next six months.

Orders for computers generally had slumped during July and August but would revive in September, Osborne predicted.

He denied estimates that demand had slumped from a peak of 27,000 units a month to 2,000 a month now, claiming that both figures were exaggerations. But he declined to give the actual figures.

One Osborne official indicated that the highest output achieved would have been 8,000 to 9,000 a month.

In the US IBM had taken over the market, he said, so they would be bringing out an IBM-compatible machine which would be shipped "in volume" from November.

The California plant recently shed about 200 workers.

## Calma suspends a senior European manager

by Kevin Cahill

A SENIOR European manager at Calma has been suspended on full pay pending the outcome of an investigation.

Jim Carron, Calma's European vice-president, says that this matter is not connected with the investigation by the US Department of Commerce into allegations that Felix Popovitch, a former manager with Calma France, shipped unlicensed technology to the Soviet Union and the Eastern Bloc countries.

Sources inside the company say that the two incidents are connected and that further action by Calma and its parent General Electric are expected. A spokesman at Calma headquarters in California said that the company was at no time aware of the alleged activities of Popovitch.

Felix Popovitch and three other French nationals were placed on the export privileges "denial list" by the US Department of Commerce several months ago, pending the outcome of an investigation into illegal shipments of technology to Communist countries.

Popovitch's presence on the list only came to light when he applied for a job with another American company, Daisy Systems.

Calma refused to rescind Popovitch's resignation and both Calma and parent General Electric claim that they were totally unaware of Popovitch's alleged sideline.

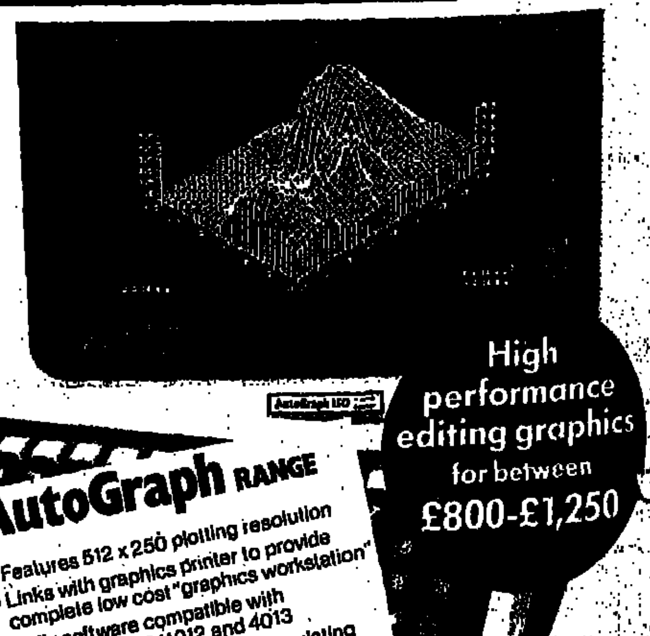
This statement is in line with the fact that for at least a month after his name appeared on the list, and while he was still employed by the company, Calma failed to take any action.

Sources in the US Commerce Dept say that legal action will take place soon. But action, other than a denial of export privileges against Popovitch and the other Frenchmen named in the investigation will be much more difficult.

Either the US Department of Commerce will have to apply for extradition or face the problem of "extraterritoriality".

Extraterritoriality is the term used to cover a country's attempt to apply its own laws outside its own territories.

The European members of Nato have strenuously resisted attempts by the US to apply US laws, particularly those regarding shipments to Eastern Europe, outside the US.

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# ComputerWeekly

Thursday, August 25, 1983 Number 874 35p


### 32-bit supermicro is on the way too

# Lookalike for Lisa from ICL

by Kevin Cahill

ICL is planning a major move at the lower end of its range with a Lisa lookalike for the end of the year, and a 32-bit supermicro to follow.

The Lisa-like machine, which is being prepared with the help of Logica and a number of other software houses, will be introduced to the market later this year, or early next year, according to sources close to the company.

The price is expected to undercut the Apple product substantially, reflecting a widespread industry view that the Lisa, while attractive in concept, is very overpriced at £8,000.

ICL is staying close-mouthed about the precise plans for the new product, but industry analysts are talking about a price around £6,000.

The year-end straddle for the launch gives ICL plenty of time to study the market acceptance for Lisa, and to adapt both price and launch plans accordingly.

Liz Sharpe, computer industry analyst at brokers Wood Mackenzie, says the introduction of an integrated workstation like the Lisa would come as no surprise to her and she notes that ICL still has to introduce the ICL Sinclair all-in-one flat screen phone-based workstation. (See Company News, page 6).

All this adds up to a major drive by ICL to expand the lower end of the company's product range.

So far this has been based on the DRS range of small 8-bit integrated workstations which have grown to 30% of the company's entire sales volume.

According to Sharpe, ICL has sold or has orders for 25,000 DRS machines with sales growing at 50% a year.

This focus by management on the lower end has led to widespread speculation that the company will bypass the 16-bit development in its workstations and go direct to the Motorola 68020 32-bit processor, due in production volumes around April next year.

Intel, current supplier to ICL for the processor in the DRS, is upset by the ICL decision.

This development in the DRS range is distinct from the Rair micro which ICL is selling at the rate of over 1,000 a month.

When ICL agreed to market and build the Rair device the company was hoping for larger sales, but the development of the DRS has overtaken the slow development of the Rair device.

*ST AUBYN . . . "Happy to make changes if necessary".*

# Telecom network is slow to open up

by Donald Kennett

LIBERALISATION of the British Telecom network is still bedevilled by the failure of equipment to get approval from the government approvals board.

Only one item – a telephone – has so far been approved by the British Approvals Board for Telecommunications (BABT); other devices are going through the process of re-submission. Standards for PABXs and more complex exchange and data equipment are still not available.

The target for publication of the standards is slipping by, yet only two of the five parts have been issued for public consideration by the British Standards Institute.

Small companies' difficulties were highlighted last week when P&P Marketing of London announced it will be selling a portable telephone and data terminal combination as part of an agency agreement with British Telecom's Telecom Gold electronic mail service.


Leader Comment – page 9


Although production started two weeks ago, and the company wants to put the device on the market next week, it has yet to be submitted to BABT. It is being made by BCD Telemail of Tunbridge Wells, which developed the product with the aid of a "substantial grant" from the Department of Trade and Industry.

Alvar St Aubyn, engineering director of BCD Telemail, said the company had applied to have the product tested, but had not yet submitted it. St Aubyn said he had no experience with BABT.

"If we were a Plessey it would be easier. You know all the people there and you have a track record." He added that BCD Telemail would be happy to make changes if necessary to receive BABT approval.


■ Turn to back page


# A long hot summer for system break-ins

by Howard Karten

HOT summers in the city usually bring down the incidence of US bank robberies. Computer break-ins, however, could become the new rage for August.

The US Federal Bureau of Investigation is looking into two possibly related break-ins. In the first a high school student gained access to a government nuclear weapons laboratory computer at Los Alamos, New Mexico (see full story, page 4). And last week, in an affidavit made public in a federal district court in Milwaukee, Wisconsin, the FBI revealed that it is investigating unauthorised access to the computer at New York's Sloan-Kettering Cancer Centre.

The Sloan-Kettering computer is attached to the Telenet network, a computer time-sharing system used by more than 1,000 companies throughout the US.

Although officials at the centre believe none of its records has been altered, there have been about 20 unauthorised attempts to use the computer.

Unauthorised access to the system was noticed when Sloan-Kettering records showed there were were five new computer users not authorised to access the system. The intruders were apparently able to bypass the passwords.

The FBI has named Gerald R. Wondra of West Allis, Wisconsin, as a suspect in the case, though he has not been charged.

Sloan-Kettering is world renowned for its research into and treatment of cancer. A spokesman for the hospital said the intruders had nothing to gain by getting into the computer but "thrills".

# DEC users get five-year package

by John Kavanagh

US giant Digital Equipment this week promised DECsystem 10 and 20 mainframe users at least five years of development and support for existing products, despite axing work on an upgrade processor.

And the company offered users a pioneering role in bringing together the TOPS operating system on the 36-bit DECsystem range and the VMS system on the newer 32-bit Vax family.

The news was greeted with relief by users, who were worried about the short-term future of their operations.

In a letter to users DEC said: "Just as DECsystem 10/20 customers have pioneered time-sharing and interactive systems, we now see them taking a leading role in Digital's Integrated Computing Environment.

"Customers will be able to continue to use all their existing software, while benefiting from our extensive development in networks, clusters, personal computers, Vax and communications."

The company added that work is in progress to improve processor performance.

Ian Service of York University, chairman of the DECsystem user group in Europe, said: "Five years is a long time in this business, so this statement will please users a lot, especially those worried about the short and medium term.

"DEC's point about improving processor performance is a direct response to what we in the user group asked for."

Service added that DEC's plans would be the main talking point for DECsystem users at the European meeting of the Decus user association in Zurich next week.

DEC and its users have acted very quickly to clarify the future of the DECsystem range. The company announced at the end of May it was dropping its troubled upgrade processor project.

Thumbs down to training scheme ......... 3

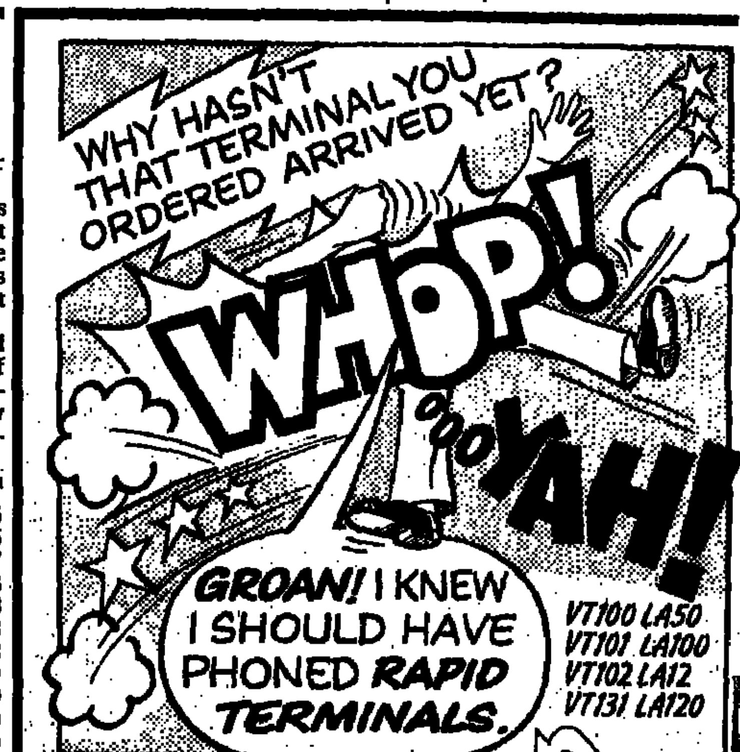
Road to fame for two in a hut .............. 12

£1m cash for British/US force ......... 4


Micro News ........................ 5
Company News .................... 6
Software File ..................... 7
Profile ............................ 8
Platform .......................... 8
Downtime ......................... 8
Liveware File ..................... 8
Leaders ........................... 9
Letters ............................ 9
Workplace ......................... 10
Puzzler ........................... 10
People, Diary ..................... 11
Company Profile ................. 12/17
Products ......................... 18/19, 22
Marketplace ..................... 20/21
Crossword solution .............. 38

Senior posts ............ 27
Job Vacancies ....... 23/39





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# Fastest by 1986 is aim of Control Data firm

*NORRIS . . . Keeping the US ahead in supercomputers.*

by John Kavanagh

CONTROL Data has set up a supercomputer firm to build the world's fastest computer by 1986. ETA Systems is 40% owned by CDC and will have 125 staff by the end of the year, 100 coming from CDC's supercomputer operation.

It will have access to CDC technology through licensing agreements and CDC will sell some of its products – and compete with it in some areas.

ETA Systems was launched last week by CDC chairman William Norris. He said the company had been formed "to maintain US leadership in supercomputers". It would design, manufacture and market its own products.

The first processor, due for delivery at the end of 1986, would run at 10 million calculations a second. This is 25 times the speed of CDC's current Cyber 205 and 10 times faster than both its successor and the Cray 2 from rival Cray Research.

CDC is putting up $100 million over three years. No decision has been taken on the rest of ETA Systems' backing.

Norris said history showed technological breakthroughs came from small teams of specialists. He added that small firms had easier access than big companies to government and private funding.

ETA Systems is headed by Lloyd Thorndyke, formerly senior technology vice-president at CDC, and the company's supercomputer executive consultant, Neil Lincoln.

Despite losing such senior people – and another 100 supercomputer specialists – to the new company, Norris said CDC would still have a very strong team to develop and support the Cyber range. The formation of ETA Systems would accelerate the development of a follow-on to the Cyber family and assure CDC leadership in the field.

At the same time, ETA Systems will make its own decisions on compatibility with CDC computers and will be free to sell to any other company.

This move is in line with CDC's policy of growth through the spawning of small companies. It has invested in some 70 firms, half being joint ventures. Other investments include a 40% stake in UK systems builder Systime.

# New centre will boost UK CAD

by John Kavanagh

A MAJOR boost to the use of computer-aided design and manufacturing in the UK is expected with the creation of a second "centre of excellence" for the techniques.

The CAD/CAM Association and Cleveland County Council are to open a £500,000-plus training, consultancy and services centre in Middlesbrough next year with £130,000 of EEC backing.

The centre is also expected to create thousands of jobs by attracting manufacturing and design engineering firms into nearby industrial units. These units will be linked to the centre's CAD equipment over a cable network.

"This is a very significant step forward in the application of CAD," said Dr Paul Arthur, executive director of the CAD/CAM Association.

"The national Cadcentre in Cambridge is a major source of development – but there is a big gap between the technology available and the level to which it is applied in industry. That gap is enormous, and it's growing.

"This new centre will stand in the middle and bring the two sides together."

The centre will cover 10,000 square feet in a £2 million, 50,000 square feet development in Middlesbrough's Britannia Enterprise Zone. It will employ 20 CAD specialists and administrative people.

In the first year, the EEC and the council will cover the training costs of £260,000. The EEC money will come from a fund for training people from companies with fewer than 500 staff. Bigger firms will pay commercial rates for training.

"CAD/CAM training is a big problem for companies," said Cleveland group planning officer Peter Ellis. "A lot of big firms in this area are showing great interest in the centre."

The EEC grant runs from October, so work on preparing courses will start in the autumn. The first courses will start in January in an existing building. Ellis said there would be at least 50 trainees in the first year, each getting up to 200 hours of courses.

He added the Department of Trade and Industry saw the centre as a good idea – but had not mentioned backing.

The government's British Technology Group was also interested, but saw its role rather as a backer for start-up firms moving into the industrial units. The British Technology Group is already a sponsor of the CAD/CAM Association.

Ellis said all political parties in Cleveland backed the idea. "This is seen as an investment in the future," he said.

# W. H. Smith and BBC both advance into telesoftware

by Caroline Burgess

TWO advances into the new telesoftware market were announced this month. W. H. Smith is offering to send video games into the home via cable TV and the BBC will transmit programs for home computers via teletext.

A new Cable Service Division has been established by W. H. Smith to market services for cable and satellite TV. Its first move will be to distribute the services of an American-based company, The Games Network, when the first cable systems are installed in 1984.

W. H. Smith will offer the system to cable operators, who in turn will sell the service to the consumer. Subscribers will receive a simple console as part of the rental.

Initially, the games will be played from the console's 94K memory. A choice of 20 games will be offered with changes being made every month. A quarter of the games are described by W. H. Smith as educational.

W. H. Smith chairman Simon Hornby said: "Although we decided, after a great deal of research, not to join a consortium for investment in the actual cable operations, we have been keeping a close watch for opportunities in this field.

"The Games Network will be our first step into providing cable services, and we are setting up this new Cable Services Division as we plan to introduce other services for cable operators."

"Teleshopping" and "telebanking" are seen as possible services for the future. At present all the games on offer are American, but there are plans to develop new games in Britain.

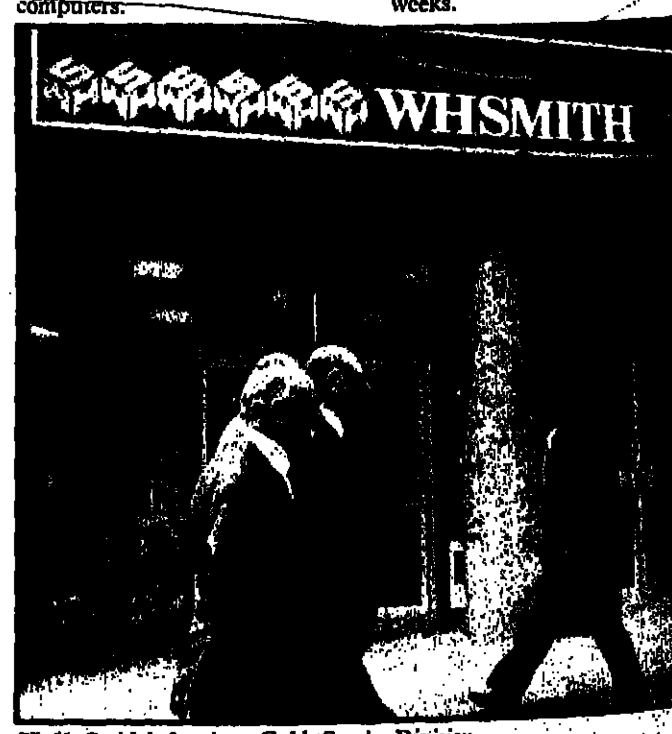
No indication of price was given by W. H. Smith. In the US subscribers to The Games Network pay $10-15 a month.

W. H. Smith, which sold £15 million of personal computers and software in the last financial year, claims that playing video games is the most popular use for home computers.

The BBC's regular transmission of programs for home computers will begin next month with the introduction of an adaptor to "lift" the programs from Ceefax. Test transmissions have been in operation since the launch of the BBC microcomputer.

The adaptor is expected to cost about £200, but the programs will be free to the user.

There will be about 12 programs available, being changed every two weeks.



*W. H. Smith is forming a Cable Service Division.*

# US price war hits Sinclair home computer range

by Philip Hunter

THE US price war for home computers has hit Sinclair Research, maker of the popular ZX81 and Spectrum machines. Timex, which last year bought the licence to Sinclair's name in the US, has been forced to cut the price of the TS-1000, a machine adapted from the ZX-81, to just $40.

But even so, sales have plummeted as Commodore and Texas Instruments have cut the price of their better-equipped home computers to $90, the price of the TS-1000 last year.

Sinclair and Timex between them sold 700,000 machines adapted from the ZX81 last year in the US. But this year total sales look likely to be only 500,000 at a lower price and profit margin.

Sinclair said it had escaped more lightly in the US than competitors like Atari and Mattel, which have slumped badly and been mauled on the Wall Street stock exchange.

Sinclair said it expected US revenue from royalties to pick up when Timex started shipping the TS-1500, which has extra memory and is fitted in a Spectrum case.

Timex also has a Model 2000, based on the Spectrum, which will sell for $200. But in the US the Commodore 64 also sells for $200 and it has more established software and a bigger keyboard.

Sinclair said it had not had to revise its sales projections for 1983, and still had a lead in the UK where the Spectrum is cheaper than the Commodore 64.

Sinclair still hopes to bring out its flat screen television before the end of the year to sell at about £60. The tube is being made by Timex at the Dundee factory troubled by strikes earlier this year. But final assembly will be elsewhere.

# Complaints are upheld against 10 computer ads

by Philip Hunter

COMPLAINTS against 10 different computer advertisements have been upheld by the Advertising Standards Authority.

Computer companies have become the biggest single group of offenders since the advent of the micro boom, and the authority's 100th case report includes details of infringements by wellknown business makers like ACT and Grundy Business Systems.

The complaints against computer or software advertisements are mostly about price, performance or the product not being available by the stated date. But the complaint against ACT was upheld because the authority considered that the product concerned, the Pulsar 16-bit business software, was not unique in its field.

ACT had claimed that the software was the only product in the market to meet five key requirements for 16-bit software: portability, pedigree, integration, user-friendly and total support.

# US is holding UK market

by John Kavanagh

THE UK has proved an attractive base for overseas computing and electronics firms, but US companies are now consolidating their dominance of the UK market.

These are the conclusions of a new report* on the UK computer industry from the research firm ICC Business Ratios.

ICC's study of 100 companies shows IBM has further confirmed its market leadership. And although ICL is still number two, it is in a shaky position.

The report stresses the importance of ICL's move into the IBM-compatible mainframe market. In fact, it says ICL's future will depend on the acceptability of these machines from the Japanese manufacturer, Fujitsu.

At the same time the report says ICL faces fierce competition at the low end of the market from firms in Europe, the US and the Far East. "Its software policies will be of strategic importance in determining its viability," ICC says.

Manufacturing output is growing rapidly: in the last three months of 1982 it rose 15%, compared with 2% in electrical engineering. But profitability is dropping off. Last year nine firms had a 50% return on capital, compared with 20 in 1980. And the number of loss makers doubled to 24.

ICC says the UK is and will remain attractive for overseas firms. Staff shortages and wage levels in the US, plus the availability of government funds and venture capital in the UK, should lead to more investment and a thriving computing industry, the report says.

*Computer Equipment Manufacturers. £121. ICC Business Ratios, 28-42 Banner Street, London EC1Y 8QE.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CSA chief is 'lukewarm' to Virgo's £820,000 project

# Thumbs down to training scheme

by George Black

THE government is to be urged to spend £820,000 on a training products scheme next year – but industry leaders are giving it the thumbs-down.

The idea seems likely to drive a wedge between the National Computing Centre, which will put the plan to the Industry and Trade Department, and the Computing Services Association, which represents most of the country's major companies in the field.

A blueprint for a £3½ million project was floated earlier this year by Philip Virgo of the NCC's micro systems division in London. But the Industry Department batted it back because it did not fit into its framework for awards of grants.

Now Virgo has remodelled the scheme and will re-submit it to officials of the Department's Information Technology division in early September. He wants the government to put up one-third grants for a first-time user training plan to be run along the lines of the already successful software products scheme.

But the CSA's director-general, Doug Eyeions, said he was "no more than lukewarm" about Virgo's brainchild.

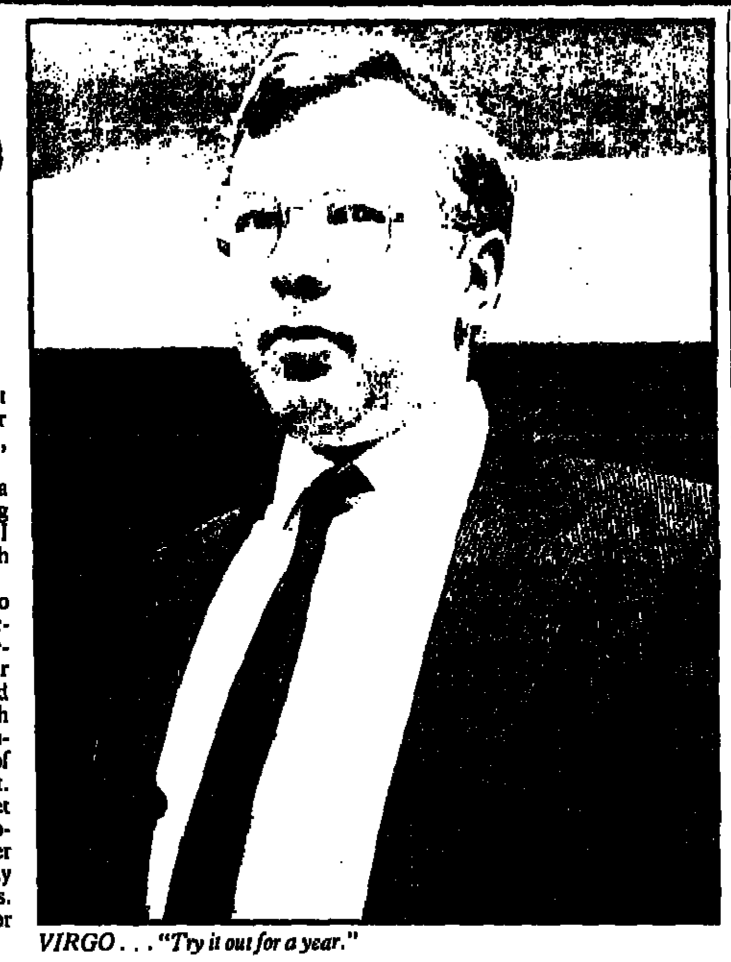
"We don't want to condemn it completely because we feel there ought to be far more spent on computer training," said Eyeions, "but we always advocate trade not aid wherever possible. The money should go to consumers, not to suppliers, we believe."

And Datasolve eduction manager Don Yeates agreed with Eyeions: "I don't think the NCC's is the right approach," he said.

Virgo wants the scheme tried out for a year to see if the City and industry can come up with at least £1½ million to provide the other two-thirds funding needed. If so, it could be renewed in 1985.

But Eyeions said: "Training is a much longer-term undertaking than software development, and I can't see a one-year approach doing much good."

The NCC project would fall into three parts – a dozen small lectures-and-slides-packages attracting £10,000 grants, other medium-sized computer-based training packages of £25,000 each and three or four full-scale computer-aided video schemes at a cost of £100,000 each to the Department. With administration and market research costs the whole programme could cost the taxpayer about £820,000 if it got under way early next year as the NCC hopes. The decision will rest with Junior Minister John Butcher.


*VIRGO . . . "Try it out for a year."*

# Star raises £2½ million in software house buy

STAR Computers is to raise £2.5 million on the Stock Exchange to buy Cambridgeshire micro software house Paxton and to build up its working capital.

The issue of 940,000 shares through brokers Simon and Coates is to go towards an initial purchase price of £280,000 for 51% of Paxton and a further share purchase of £250,000 within the next three months to increase its holding in the 9-strong software house to 75%.

Paxton's sole product, a four module accounting package called Business Desk, has 1,000 users, can run on 50 different micros and has been sold to two major companies, ICL and British Telecom Merlin. ICL uses the package as its standard accounting suite on the DRS range and Merlin is to sell business desk on its 2200 series, otherwise the ICL personal computer.

Simon and Coates will also place 135,000 shares at 270p a share for joint managing director Jack Schumann who said that he was selling them for personal reasons.

# Logica could win Hong Kong stock exchange £9m deal

by George Black

BRITISH systems house Logica is being tipped to pull off a major contract in Hong Kong against competing bids from all the big American hardware makers.

The job is computerisation of the new Hong Kong stock exchange, valued at between $7 and $9 million. A decision is believed to be imminent, and though Logica people are being cautious the firm's new tie-up with Jardine Matheson, the foremost trading company in the colony, is being seen as a trump-card. Jardine Matheson is a large shareholder in Hong Kong Land which will do the main building work for the redevelopment of the dockside site.

The new centre, including two tower blocks of the size of London's NatWest International, is due for opening in April, 1985.

Logica and Jardine, which are planning to form a joint computing venture to cover the whole Southeast Asia region, have bid against IBM, Sperry, Honeywell, Burroughs and others.

John Watson, who was head of the Talisman project for computerising the London Stock Exchange, said it would be an enormously complicated undertaking. Hong Kong's four separate stock exchanges were being integrated first, but there was also a large number of broking firms to be linked up.

For Logica to succeed would not only be a boost to British morale in the industry but also to Tandem, whose NonStop failsafe hardware would be used. Tandem has been seeking to throw off strong challenges from new rivals Synapse and Stratus in the US.

All Hong Kong dealing is still done on blackboards with TV cameras trained at them. Settlement is all by paperwork. Watson said the challenge was to get rid of the paper and speed up the whole business.

Logica's deal with Jardine is the latest in a series of moves to spread the firm around the world. Through recent acquisitions and partnerships it has gained entry to the US, Australia, Sweden and Germany.

Managing director Len Taylor said: "We aren't favourites for the contract but whether we get it or not doesn't affect our relationship with Jardine. We've been wanting a permanent place in the Far East for some time, so our people don't have go go on shuttling to and fro and we're very pleased we've now solved that."

*TAYLOR . . . "A place in the Far East"*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Or better still, come and see for yourself the latest in computer hardware (from mainframes to personal computers), software, peripherals, accessories, word processing, consultancy and training services, communications equipment or even voltage stabilizers.

If you're interested, you could also attend the 3rd Gulf Computer Conference organised by Middle East Computing Magazine on November 22nd and 23rd in the Trade Centre's Theatre. And hear a panel of reputed speakers focus on computer information and experience that is relevant to the Gulf.

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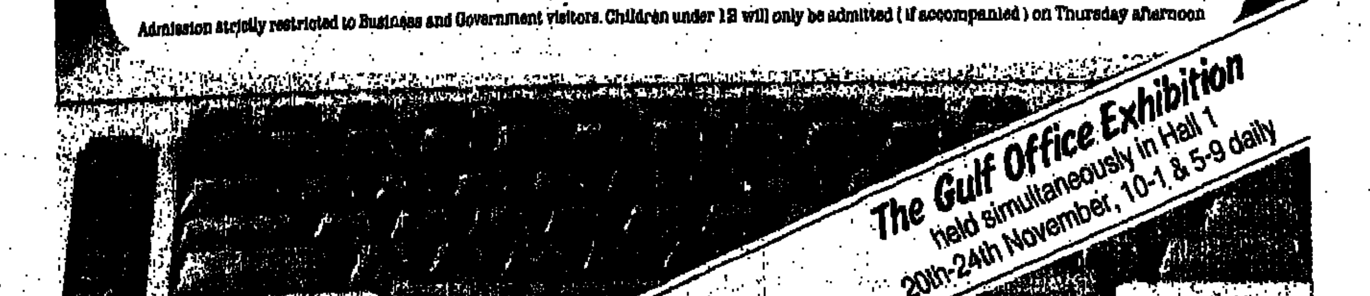


Burroughs and Fortronic in long term collaboration

# £1million cash for British-US force

by Nuala Moran

BURROUGHS has given Fortronic, the Scottish-based banking and financial computer terminal manufacturer, £1 million to develop a terminal for the financial marker.

The new terminal, which is expected to be announced later this year, will be based on Fortronic's existing F65 terminal.

Part of the deal is an agreement for Burroughs to purchase 15,000 terminals, worth £20 million, from Fortronic in the next three years.

According to the two companies this is not just a three year-agreement. There are plans to continue collaboration on a longer term.

Bob King, Burroughs' UK managing director, said: "We are teaming up to create a British-US force in the world financial terminal market. We intend to develop jointly new ranges of equipment and open up worldwide markets to large quantities of British-made financial systems.

"The relationship with Fortronic includes all steps from development to customer support."

Bob Archibald, Fortronic marketing director, said that the company had experienced problems with supporting sales outside the UK. "We decided we needed a relationship with a company that had the necessary contacts," he said.

From Fortronic's point of view this is the main reason for the tie up. Burroughs will put 5,000 people into selling the new terminals and will have a similar number providing administration and engineering support worldwide.

Burroughs and Fortronic have had a marketing agreement since 1981, covering Europe and Africa. This resulted in orders approaching £10 million, of which about 70% were for exports.

The two companies also worked together in designing counter terminal systems for the Post Office. A pilot installation has been working in York for the past nine months, based on Fortronic counter terminals linked to and controlled by a Burroughs mini.

Explaining the decision to farm out the research and development in an area on which Burroughs has based its reputation, Clive Bartram, Burroughs' development manager for financial marketing, said: "The Fortronic terminal does everything we want it to do.

"It would take two to three years to develop this ourselves. Instead we have got something we could sell today."

But Bartram stressed that the Fortronic integrated terminal is not the answer to every problem. Burroughs took the route to modular terminals in the late 1970s, he said, and there were still plenty of markets for this type of product.

Once production exceeds 500 units a month, Fortronic expects to take on 60 new staff. Other joint development and manufacturing projects in the pipeline with Burroughs will create at least 40 further jobs.

Fortronic has a new custom built factory near Dunfermline, leased from the Scottish Development Agency, where the terminals will be produced. The company had a £6.7 million turnover last year and currently has 300 employees.

*KING . . . "Teaming up to create a British-US force."*

*ARCHIBALD . . . "We needed a relationship with a company that had the necessary contacts."*

## SALES BRIEF

### RAF places order for 22 minis

US MINI maker Perkin-Elmer has scooped an order for 22 [illegible] computers for the RAF. The machines will be used in the Tornado F2 Mission Simulator programme to develop simulators for air crew training aids for the new Tornado aircraft.

Perkin-Elmer will supply 11 of the machines to the major contractor, Singer. It will also supply hardware extension to allow programs normally written in high-level languages to be implemented in machine code for greater speed.

### Cementing deal

KENT Process Control has won a £100,000 contract from a government-funded cement kiln consortium for a process control system. The idea is to optimise the quality of the cement produced by the kiln at Derbyshire, and reduce energy.

### Import Dialog

A VIEWDATA system designed for communication between dealers has been installed by motor vehicle importer VAG UK. The system called Dialog was supplied by Comdial Communications, and uses 550 terminals to connect the 380 Audi Volkswagen dealers in the UK with VAG headquarters in Milton Keynes.

### Finding the cure

FAMAR, the computer service for farmers based in Cheltenham, has won its first export order – from two Belgian homoeopathy doctors. The order, worth £9,000, covers a complete database of patients and cures.

### Ships sale

LONDON systems house Turnkey & Applied Computer Systems has collected a £120,000 contract from the ferry company Finanglia Ferries, for the supply of the Ships accounting package. Software supplied includes packages for import, export and cargo booking, and implementation will be on a DEC PDP 11.

### Cemetery buy

AN Australian catholic cemetery has come to the UK for a stock control package for use in controlling valuable plots. Compact Software International, the Surrey based microsoftware house, picked up this unusual contract from Sydney Catholic Cemetery.

### Oil for Chips

ABERDEEN micro company Granite Chips has notched up another contract from the North Sea oil industry, with an order from Total for micros and consultancy. The company will supply the UK-made Comart Communicator micro, with access to the VisiOn project planning software installed on a Prime minicomputer.

### Phoenix update

PHOENIX Assurance of Bristol has replaced its phototypesetting equipment with the Modulef Copposition System from Gestetner for use mainly in revising and updating working leaflets such as sales aids, forms and premium guides. The system comes in modules allowing the buyer to tailor it to his needs more than was possible with first generation 'composition' systems.

### Sperry for hi-fi

LASKY'S, the high street hi-fi supplier, has opted for Sperry's dual System 80 machine for further automation of accounting and administration. The equipment will be installed next year, and will include two Model 86s, each with two Mbytes main memory and 1,200 Mbytes online disc storage.

# Orion puts software for IBM on market

by Nuala Moran

NEW communications software for IBM Systems 34, 36 and 38 is being launched by Orion Software of West Yorkshire. Called Network Orion, it will be available next month to UK and European users.

Network Orion is designed to appeal to a single site user with one System 34 or a multinational with hundreds of "Xs" around the world. It can interconnect 34, 36 and 38s so companies can have the appropriate capacity machine at each location.

Orion allows 3X to communicate with other carriers, such as Telex, or other hardware, such as word processors and remote data terminals. It made no difference to the user what kind of machine at the location was being addressed, said Wilton Rooks, chairman of Orion's US subsidiary. This gave a company great flexibility in the way it managed its hardware, he added.

The communications network is a rewrite of a system which Orion launched two years ago. Rooks explained that over the past couple of years the company had built up experience of the market and found that a new approach was necessary to meet user requirements.

"That's why we went for a modular structure," he said. "This means that Network Orion works for a single site 34 user but it also works for a multinational with lots of 3Xs.

"We have in fact placed more emphasis on single site users and on intercommunications to other carriers."

Using Orion, various methods of communication and types of traffic can be combined. It has facilities for remote data processing, electronic mail and text transmission. Users can also combine text or data files with electronic mail for transmission to any remote system.

The network was developed from the point of view of the user, rather than the data processing department. All procedures for transmitting information are identical. The user just specifies the information to be sent and who it should be sent to, without any data processing being required.

For example, a user with a standard terminal can create telexes by simply keying in the message. The system looks up the telex number, routing code, etc, so it is no longer necessary to have a separate Telex room.

*ROOKS . . . "We have placed more emphasis on single site users."*

# ICL fails to win seal for Dilis

by John Kavanagh

ICL HAS been refused the seal of approval from the Chartered Institute of Public Finance and Accountancy (CIPFA) for its Dilis direct labour management system for local authorities – this time for good.

CIPFA has washed its hands of the UK firm, which was named as one of its two preferred suppliers of direct labour systems more than two years ago. In that time ICL has tried – and failed – three times to get formal CIPFA approval for Dilis. The other supplier, CMC, passed the CIPFA test.

"Dilis is not the product we want and our decision will not be reviewed," said CIPFA undersecretary Brian Aldridge.

CIPFA said Dilis users could now decide on the priorities and direction for the package, instead of relying on CIPFA influence.

This final decision offers some satisfaction to other suppliers, including NCR and UK firm ABS Computers, which felt the "preferred supplier" tag given CMC and ICL two years ago was an unfair advantage. The others nonetheless went on to win many orders.

Dilis user group chairman Frank Baxendale, assistant treasurer of Lancashire County Council, said most of the 100 users were now generally satisfied with the system. ICL's failure to win CIPFA approval was sad, but this did not mean there was still widespread dissatisfaction, he said.

The CIPFA specification had been very rigid, said Baxendale. "What is needed now is really tuning and some broadening of the system."

Douglas Thomas, deputy treasurer at Carlisle City Council, said the user group had put a lot of pressure on ICL and problems were now of getting priority treatment. "It's going much better and in the end it will do what we want," he said.

ICL said: "The user group decided some time ago that ICL's priority should be to satisfy customers' needs and that meeting CIPFA's requirements was a secondary factor."

■ ICL's package for handling new housing benefits legislation is making slow progress, according to users, but the company said it was winning contracts from other suppliers. Guildford City Council said it had taken on an ICL specialist for seven weeks to sort out its problems.

ICL said: "We admit there are still problems, but we are working with local authorities to get implementation going."

# Systime sets up robotics company

by John Riley

SYSTIME'S plan to set up an independent robotic systems company, announced last week, marks one of the earliest spin-offs of a government-aided project to develop an unmanned flexible manufacturing system.

The project, called Scamp (Sixhundred Computer Aided Manufacturing Programme), was completed last November, when an automatic factory, using a computer control system developed by Systime and Fanuc robots, was opened to manufacture machine tool components.

The five-year, £3 million project, which received an estimated £1 million from the Department of Industry, was set up by the 600 Group Company, the holding company for over 30 major machine tool and engineering manufacturers.

As well as setting up a robotics company, Systime also announced that it is setting up software franchises for its vertical software packages, and that it is encouraging some of its staff to set up satellite companies with franchises to help sell and support packages.

Systime's new robotics company is in the planning stages and, according to marketing services manager Clive Hay-Smith, is still in the "discussion period". The company has its own Special Systems Group, which it wants to expand by reorganising its pure research and development functions.

# Texas turns to artificial intelligence market

by Philip Hunter

TEXAS Instruments has set about reviving its flagging fortunes by moving into the artificial intelligence market. The company last week announced that it had bought a 25% stake in Lisp Machines Inc (LMI), the US maker of computers dedicated to AI applications.

TI has also started marketing a new super micro in the US aimed at the AI market. The machine is based on the NuBus technology, which allows a number of processors of different makes to be combined on a single board. The product, called Nu Machine, is not a complete computer, but a raw machine that can be adapted for different applications by adding processors.

LMI has added a processor board to make the machine into a computer dedicated to running the AI language Lisp, which is widely used in the US.

The main UK competitor for the machine – when it is announced here – is made by Symbolics and marketed in the UK by Electronics Associates.

LMI's machine will be cheaper, but slower than the Symbolics rival. But it is expected to have the advantage of being able to combine different applications because of the NuBus technology.

NuBus was developed by Western Digital and the Massachusetts Institute of Technology.

# War Games password used in boy's computer break-in

by Howard Karten

THE Federal Bureau of Investigation, FBI, is investigating an alleged computer break-in by a Milwaukee high school student to a Los Alamos, New Mexico, national laboratory.

The student, Neal Patrick, is described by his lawyer as a bright, high school "hacker", who learned about computers on a six-week course last year.

An FBI spokesman in Milwaukee explained that the bureau was not releasing any details of the case, owing to the still preliminary nature of the investigation and the youth's status of minor.

Details of the case that have so far leaked out indicate that Patrick was apparently one of a group of students and "hackers" who call themselves Joshua. Joshua was the key password needed to access a Norad defence computer in the new film, *War Games*.

The group is believed to have been responsible for multiple computer break-ins throughout the country in the past 10 months.

In this case, Patrick apparently accessed the Los Alamos computer through the Telenet packet-switched network. Telenet is a nationwide public-access network, to which a wide variety of commercial, academic, and research computers is connected.

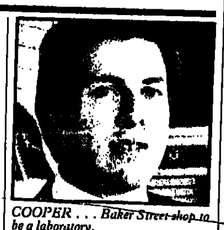
Patrick and the others involved – some of them over 21 – were apparently caught through FBI intercepts.

Patrick's lawyer, Paul Piaskoski, has negotiated legal immunity for his client. The others involved potentially face criminal charges of wire fraud, a federal crime involving theft of services or goods perpetrated via interstate communications.

Telenet, a subsidiary of US corporation GTE, published a list of the publicly-accessible computers attached to the network, along with their network addresses or access codes.

This list is intended for legitimate subscribers to those computers, although in practical terms it is available to almost anyone. *Computer Weekly* was unable to determine if this list included the Los Alamos computer.

However, by simply trying various network addresses in sequence, it is possible to learn of computers not in that list. One computer bulletin board at least includes a voluminous listing of Telenet network addresses.



*COOPER . . . Baker Street shop to be a laboratory.*

# US group opens first of 75 stores

by Philip Hunter

A US franchising group is setting up in the UK to sell microcomputer packages to the businessman. The group, trading in the UK as Programs Unlimited, last week opened its first shop at a prestigious site in London's Baker Street.

Another big US franchise group operating in the UK is Computerland. It has 440 shops worldwide, mostly in the US, but only two so far in the UK.

Fred Zenna, operations chief for the US parent of the new UK outfit, said Programs Unlimited would focus more on the businessman, and would offer a complete service with software, consultancy and training.

Programs Unlimited is part of a New York-based group which has 600 hairdressing franchises in the US. In the next two years it plans to open 100 shops to sell computers in the US and 75 in the UK.

The Baker Street shop would stay in the company's ownership and be a laboratory to test new hardware and software before releasing it, said UK managing director Jeffrey Cooper.

# MPs' funding problems 'horrific'

by John Kavanagh

THERE are "horrific" problems of funding and organisation facing plans to give MPs automation in their offices at the Commons. But the plan could be worth £5 million to a computer supplier.

So said Dr Gordon Ross, advanced office systems manager at the consultancy EIU Informatics, which has completed a study of MPs' information technology needs.

"There's a lot of opportunity and MPs now have the chance to build a comprehensive system," said Ross. "At the same time the MPs are rather like a lot of small businesses, each with their own computing needs.

"But there are horrific funding problems. MPs have allowances to buy office equipment, so some are buying their own micros. In addition the life of the equipment is longer than the life of a parliament.

"At the same time secretaries have big workloads but experience shows staff need a long learning period for office automation."

EIU proposes some pilot projects with heavy support and detailed monitoring. They should start simply, perhaps just with word processing.

There are 650 MPs and about 1,000 secretaries and research assistants. EIU proposes that offices be equipped with single devices handling word processing and personal computing plus communications for access to the Commons' library and other information systems.

## MICRO NEWS

# Share issue by Intelligence to fund Seiko range in UK

MICRO software house Intelligence (UK) is seeking £1 million from a share issue to fund its plans to distribute the Seiko range of micros. It will set up a new subsidiary, Intelligence Distribution, to handle the Japanese-built 16-bit machines.

Intelligence was appointed by Japanese trading conglomerate Marubeni as UK distributor for the Seiko kit last month, and has already appointed ex-Marubeni consultant Colin Turney as marketing manager of the planned distribution subsidiary. Marubeni holds European distribution rights for the hardware from the Japanese manufacturer Selkosha.

"Our technical evaluation of the Seiko 8600 has convinced us it will prove highly successful in the UK market," said Intelligence managing director Ashley Ward. "We will be offering it with the complete range of Intelligence software, plus software from other leading vendors."

In the software offerings it will not be going for "esoteric" packages, claims Ward. "We want real-standard no-frills stuff, though we are making strenuous efforts to make sure that the software – particularly the accounting packages – is true multi-user software."

The Seiko 8600, an 8086-based machine supporting various popular operating systems including CP/M-86 and MS-DOS, made its first appearance in Europe in April. Wrangling between rival "exclusive" distributors for the UK at the time cast a shadow over the machine's UK announcement. Both Marubeni and US-based Sci-Com announced their intention to market the Seiko 8600 in the UK, Sci-Com through Synchronised Computers, a UK company specially set up with Sci-Com's support for that purpose.

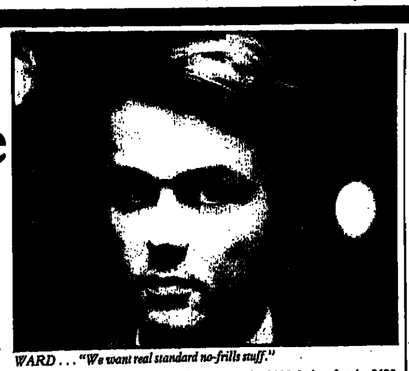
Although Intelligence kept a low profile throughout this period of wrangling, it was always there as Marubeni's heir apparent UK distributor, according to Ward.

Now Synchronised Computers has left the distribution scene, and founder John Clarke has turned his attention to handling SMC's software in Europe.

Intelligence plans to raise the money for the distribution subsidiary through the issue of further share capital. It intends to set up a network of 100 dealers for the 8600 range. Dealers are being recruited now ready for the planned public launch of the machines in mid-September.

The 129,000 new shares will be placed with CIN Industrial Investments, a new investor that will take 90% of the issue, and existing shareholders Murray Technology Investments – subject to the approval of shareholders at an extraordinary general meeting held this week.

The issue will bring the number of Intelligence shares to 690,000. Murray Technology will maintain its 18% holding in the company, and Ward will remain the largest shareholder.



*WARD . . . "We want real standard no-frills stuff."*

# LAN firm signs £1m agreement with Canon

by Caroline Burgess

A MAJOR contract with NEC, a £1 million agreement with Canon and a move to larger premises are all aiding a small British company, Quorum, in its aim to become a leading designer of local area networks.

Originally set up in 1979 under the name Q1 Europe by the British Technology Group with £250,000 of government investment, Quorum was formed last month by a management buy out.

Quorum develops, manufactures and markets multi-user microcomputer systems based on its own networking system, QuorumNet. A daisychain network of workstations connected by coaxial cable QuorumNet has a mass storage unit of 85 megabytes, which will support up to 64 simultaneous CP/M users.

Under Quorum's agreement with NEC, QuorumNet will be used with the NEC PC8000 personal computer. "If you could be seen to sell to the Japanese then you take a significant step forward in terms of credibility," said Alan Brown, Quorum managing director.

Quorum's contract with Canon will make QuorumNet available with Canon's 16-bit microcomputer AS-100 from this autumn. The AS-100 was introduced in the UK earlier this year.

Ray White, product manager for Canon's small business computer division, said: "The availability of local area networking capabilities in microcomputers will make comprehensive data handling and information processing systems accessible to most businesses."

Quorum announced this month that it had moved to larger premises in Southampton.

*BROWN . . . Signs with Canon.*

*Micro News is compiled by Robert Parry*

# Manufacturers shun the 16-bit marathon

by Caroline Burgess

THE London Computer Marathon ended last week with the result far from conclusive. Billed as the first reliability test for 16-bit computers all entrants finished the course. But some machines recorded faults.

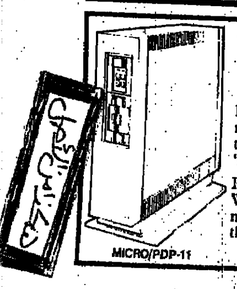
The Olivetti M20 and the Samurai S16 were judged best on straight reliability, as two machines from each company finished with no recorded faults. LSI M Four and Wang Professional came next, each with one machine finishing with no errors. IBM Personal Computer and Comart Communicator each had one machine finish, but both recorded faults. All except Comart entered two machines.

What emerged from the marathon was a wide difference in the speeds of the machines entered. Wang was the clear winner here completing the set program 1,192 times.

Surprisingly the Olivetti – which is thought of as a speedy performer – recorded a score of only 142. The Samurai managed 277, IBM 127, Comart 96 and LSI 980.

The marathon was sponsored by Micro Network, the sole UK distributor of the Samurai S16 micro. It invited all manufacturers of single user 16-bit microcomputers to enter. But out of the 31 invited only six entrants emerged. IBM did not enter but a personal computer was put in by dealer Spartex Micros.

The machines ran the reliability test non-stop, 24 hours a day for seven days – except for a six-hour delay at the start due to a power failure.

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## COMPANY NEWS

### Sales forecast to rise sharply to £1 billion next year

# ICL shares are a buy, say brokers

A BUY recommendation for ICL shares has come from one of the most cautious computer industry watching teams in the City.

Liz Sharpe, computer industry analyst at stockbrokers Wood, Mackenzie, cautions that 1983/84 will be the first real test for ICL, still one of the most fragile shares in the technology sector. But Sharpe says her forecasts "assume success".

At the hub of her prognostications is the belief that ICL will plug the gap between the arrival of the DM1 and Estriel and the inevitable slowdown in orders for the 2966 and ME29. The DM1, which will replace the ME29, is due in 1984. The Estriel, being built with the help of Japan's Fujitsu, is due to succeed the 2966 in 1985.

Sharpe is looking for a pre-interest charge profit at ICL of £85 million for the year ending September 30, 1983, and £73 million for 1984. Sales are forecast to rise sharply to £845 million this year and £1 billion next.

Sharpe talks of a dramatically changed ICL, with the product line rationalised and manning levels about par for the industry.

Overmanning was one of the three key areas facing ICL when its financial crisis broke in 1981. The others singled out by Sharpe were a weak product range at the workstation/micro end, and a narrowly based marketing effort.

Some 9,000 employees were shed, and now labour costs account for 40%, down from 49% in 1981, as a percentage of turnover. The employment picture at ICL is brighter, with 1,500 employees added to the payroll since last year.

Sharpe says that while ICL was primarily a mainframe company before its reorganisation, it now has plugged the gap at the lower end of the range and added value at the top end. The basic range at the top end will be reduced with the introduction of new models in 1984 and 1985, but it will cover "a broader spectrum of processing capabilities". At the lower end are the microcomputers from Rair and the DRS workstations.

But the most radical changes at ICL have been in marketing, Sharpe says. Prior to the collapse, marketing was limited to direct selling with some one-off systems work. With the addition of Traderpoint, which sells machines to OEMs, and Computerpoint, which sells through distributors, ICL now has full access to the marketplace.

While Sharpe describes many of the steps ICL has taken as "basic housekeeping", she believes that it has taken networking to its heart – "making one of the most powerful commitments yet seen by a computer manufacturer".

Communications between its own computers and others will open up the marketplace, with most of the current drive for growth coming from distributed/communicating systems – the small end workstation. Distributed systems already account for 30% of total volume deliveries, which include micros, workstations, and some minicomputers. Srandalone processors account for 70%, mainly the 2900 mainframes and the ME29.

Sharpe comments that many doubt whether ICL's strategy will succeed, given the historic performance of the company. And the rationale of the strategy is still untested, although Sharpe calls it "subtle and sound".

She notes that many of the links forged with other companies were not essential to the main product strategy, but they did whet the appetite of the City for the company's shares.

Looking at distributed systems, they account for 30% of deliveries by value, and sales grew by 30% last year.

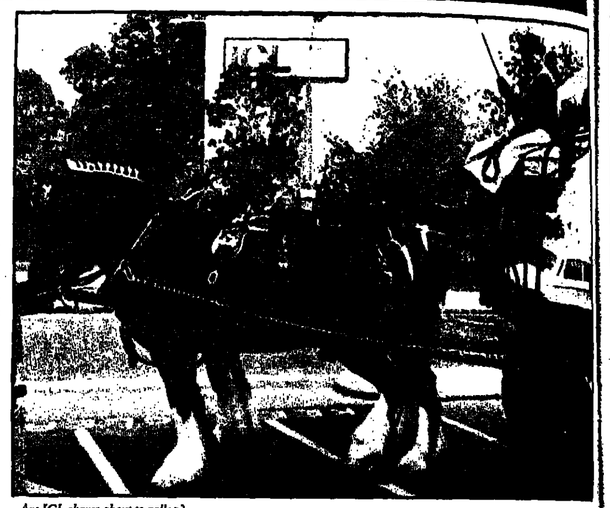
Shipments of the Rair microcomputer are put at 1,000 a month, with all sales going through Traderpoint. The main negative against the product is its lack of networking capabilities.

Sales of the DRS workstations are growing at 50% a year, Sharpe says. Current orders stand at 25,000 systems to over 1,200 customers.

The System 25, which replaced the old System 10, has an installed base of 2,500, with 60% sold in export markets. The System 25 was the first ICL product to support IBM's System Network Architecture, and a recent spate of enhancements to the machine, such as telex, viewdata and coupled systems, will prolong its life.

The DRS range, Sharpe says, provides the main company thrust into the networked/distributed resource end of the market. The DRS multiprocessor architecture ensures a range of processing power suitable for all needs, Sharpe says. At the same time, the market is one of the smallest for micro/workstations and one of the least competitive.

In her concluding remarks, Sharpe makes the following strategic assessment:



*Are ICL shares about to gallop?*

"Throughout the period of reconstruction, ICL was a spectacular performer. Now that the reconstruction is at an end, and all the theories are about to be tested, investors have developed cold feet. While accepting that our 'buy' strategy is high risk, we feel there is enough evidence to justify purchasing the shares before the expected strong growth begins. In terms of likely prospects, the shares look cheap now.

"ICL has developed a balanced and promising range of products. Can these products be marketed successfully? Certainly the structure now exists for ICL to sell into world markets. The marketing structure, tighter financial controls and rationalisation of costs have been put in place in a relatively short two years – an impressive performance that has of late been marked by the razzmatazz with which the City has surrounded the SX2000 from Mitel.

"There are still hurdles for ICL. Among them motivating the workforce and convincing highly competitive US market that it is a viable entity, must feature heavily.

"We neither ignore these hurdles nor are we unaware of them. But we believe that they can be surmounted."

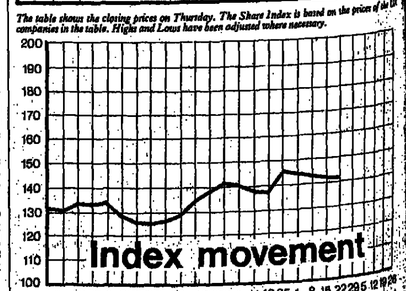
## SHARES TABLE

*The shares table, which is specially compiled for Computer Weekly, shows selected computer companies that reflect the state of the computer industry.*

Date 19/8/83 — Index 141.16 — Change -1.6

| Pence 1983 High | Pence 1983 Low | London Stock Exchange Stock | Price | C'nge | $ 1983 High | $ 1983 Low | US Stock | Price | Cge |
|---|---|---|---|---|---|---|---|---|---|
| 548 | 240 | ACT (App Comp) (25p) | 485 | -35 | 26 | 13¼ | Amdahl | 19⅝ | -⅜ |
| 88 | 41 | B. Boy Kent (25p) | 63½ | + 8 | 60 | 29¼ | Apple Inc | 29¼ | + ⅛ |
| 194 | 130 | Cado (50p) | 152 | - 2 | 50 | 28¼ | Auto Data Pro | 41⅝ | + ⅛ |
| 178 | 120 | Cole Group (25p) | 140 | - | 67¼ | 40¼ | Burroughs | 51⅝ | + ⅛ |
| 332 | 188 | CASE (50p) | 264 | - 2 | 18 | 10¼ | Compu Labs | 17 | + ⅛ |
| 508 | 400 | De La Rue (25p) | 500 | + 17 | 22 | 17 | Compu Vis | 19⅛ | - ⅛ |
| 376 | 264 | Exist (25p) | 360 | + 5 | 129⅜ | 70¼ | Control Data | 43½ | - ⅛ |
| 588 | 411 | Fairtest (50p) | 515 | + 13 | 63½ | 35¼ | Cray Research | 44 | - ⅛ |
| 348 | 182 | DEC (5p) | 318 | + 4 | 91 | 37¼ | Data General | 76 | - ⅛ |
| 82 | 66 | ICL (25p) | 72 | + 2 | 73¼ | 41 | Datapoint | 36⅛ | - ⅛ |
| 62 | 41 | Kalamazoo (10p) | 52 | + 1 | 53½ | 18¼ | Diebold | 28⅛ | - ⅛ |
| 376 | 276 | Kode Int (50p) | 279 | + 10 | 157½ | 103¼ | Digital Equip | 85⅛ | - ⅛ |
| 570 | 270 | Memec (10p) | 500 | + 26 | 46¼ | 21½ | Don Data Sys | 29⅛ | - ⅛ |
| 180 | 133 | Micro Focus (50p) | 141 | - | 50 | 28¼ | Dysan Corp | 36⅛ | - ⅛ |
| 880 | 460 | Nmarket (1981) (60.06) | 818 | + 24 | 43¾ | 19¾ | Gould | 27⅛ | - ⅛ |
| 2700 | 987 | Norsk Data | 2700 | +200 | 91 | 27¾ | Harris | 34⅛ | - ⅛ |
| 232 | 207 | Office & Elec (25p) | 209 | + 2 | 98 | 74 | Hewlett-Packard | 74⅛ | - ⅛ |
| 1230 | 710 | Philips Lamp (£1 10) | 1087½ | + 5 | 194 | 46 | Honeywell | 46⅛ | - ⅛ |
| 266 | 178 | Reuters (25p) | 200 | - 20 | 41½ | 20¼ | Intel | 32⅛ | - ⅛ |
| 20 | 16 | Smart Auto (10p) | 18 | + 2 | 122½ | 39¼ | IBM | 122⅛ | - ⅛ |
| 504 | 418 | Sperl Elec (25p) | 469 | + 10 | 71½ | 54½ | Linton Ind | 54⅛ | - ⅛ |
| 350 | 225 | Star Comp (10p) | 320 | + 10 | 125½ | 60¼ | MDB (Mohawk D) | 60⅛ | - ⅛ |
| 310 | 278 | Tarmac (50p) | 293 | - 6 | 32½ | 19 | MBA (Magnet Bc) | 19⅛ | - ⅛ |
| 618 | 418 | Thorn-EMI (50p) | 612 | - 1 | 104½ | 58¼ | Magnet-Astrid | 58⅛ | - ⅛ |
| 177 | 130 | UCB (25p) | 167 | | 10 | 5½ | Microdot | 5⅛ | - ⅛ |
| | | Unlisted Securities | | | 448 | 29½ | Motorola | 41⅛ | - ⅛ |
| 128 | 78 | Bus Comp (10p) | 88 | | 67 | 29½ | National Semi | 29⅛ | - ⅛ |
| 130 | 110 | CPC (5p) | 120 | | 124½ | 24 | NCR | 48⅛ | - ⅛ |
| 198 | 115 | Cimn (10p) | 188 | + 13 | 24 | 14¼ | Perkin-Elmer | 14⅛ | - ⅛ |
| 265 | 149 | Comshare (C&P) (10p) | 258 | + 2 | 28¼ | 15½ | Raytheon | 15⅛ | - ⅛ |
| 188 | 168 | Ferranti Pack (50p) | 188 | - | 31½ | 20¼ | Sperry | 20⅛ | - ⅛ |
| 94 | 77 | J.B.D Comp (5p) | 77 | - | 44½ | 20¼ | Sperry Comp | 20⅛ | - ⅛ |
| 76 | 70 | M.M.T. (5p) | 76 | - | 34½ | 16 | Storage Tech | 19⅛ | - ⅛ |
| 300 | 160 | Memory Comp (R10p) | 300 | + 5 | 24¾ | 14¼ | Tandon | 14⅛ | - ⅛ |
| 448 | 268 | Micro Bus (10p) | 448 | + 40 | 51½ | 37¾ | Tandy | 37⅛ | - ⅛ |
| 448 | 268 | Micro Focus (10p) | 448 | - | 171 | 90 | Texas Inst | 90⅛ | - ⅛ |
| 448 | 310 | Microgen (10p) | 430 | - 10 | 28 | 16½ | Tymshare | 21⅛ | - ⅛ |
| 268 | 238 | Sinclair (10p) | 260 | + 2 | 40¾ | 17 | Wang Lab B | 13⅛ | - ⅛ |
| 217 | 166 | Wang (£1) | 207 | + 2 | 17 | 9½ | Wyly | | |
| 173 | 173 | Rank Inv (5p) | 173 | | | | | | |
| 125 | 111 | Scots & Eng (10p) | 118 | - 2 | | | | | |
| 197 | 110 | SecurDat (10p) | 110 | - 10 | | | | | |
| 88 | 63 | Tech Inv Auckland (10p) | 88 | + 8 | | | | | |
| 80 | 63 | Trident Comp (10p) | 80 | + 8 | | | | | |
| 107 | 66 | Zygal Dyn (5p) | 106 | | | | | | |

*The table shows the closing prices on Thursday. The Share Index is based on the prices of the 100 companies in the table. Highs and Lows have been adjusted where necessary.*




*Company News is compiled by Kevin Cahill.*

## SOFTWARE FILE

*MICHIE . . . Pioneer.*

# £2 million US cash sought to fund AI program

EXPORT Software International, the Edinburgh distributor, is seeking to raise up to £2 million in the US by the end of this month to fund promotion of an artificial intelligence program.

It foresees a large market for the spreadsheet rule generator for businessmen called Expert-Ease. Written by Edinburgh University's expert systems pioneer Donald Michie, and produced by Michie's firm Intelligent Terminals, it runs on the IBM-PC and Apple II micros.

Expert-Ease, coded in UCSD-Pascal, was adopted by ESI in June. Now ESI wants to set up shop in the US to sell it itself.

But if the attempt to raise cash fails, then at least three well-established American concerns stand poised to help it out. They are MS-DOS operating system author Microsoft, publisher McGraw-Hill and author of the dBase-II micro database system Ashton-Tate. Microsoft, meanwhile, is said to be pursuing its own artificial intelligence research.

ESI is now keen to add to its collection and is negotiating for another Michie program, a big brother to Expert-Ease to run on the DEC Vax mini under Unix. It is also talking to a Yugoslav organisation about a system known as Decmak.

The Edinburgh company made its name with a utility collection for the IBM-PC and Sirius machines called Toolbox, which is now being unbundled. The 8-to-16 bit conversion system is to be sold separately. Toolbox is being sold in the US by a Californian firm.

# Supercalc author in bid for UK market

ONE of the foremost American micro spreadsheet firms, Sorcim, is to steal a march on its rivals with a bid to grab the British market.

Sorcim, the San Jose, California, author of Supercalc – version two of which now ranks in the top five products – has appointed Sirius distributor ACT of Birmingham as its main UK agency.

The announcement comes as current field leader Lotus Development of Massachusetts is on the verge of establishing its own distributorship for tackling the European market.

Lotus has won its position with a second generation package called 1-2-3 that integrates word processing, database management and graphics.

Microsoft's Multiplan and Context Management's MBA are the other major contenders, with Visicorp, whose fortune was founded on Visicalc, dropping back in the race until its VisiON environment is launched later this year. At present there is still everything to play for in the 16-bit machine world.

Sorcim's alliance with ACT means that those already selling Supercalc here, such as Tamsys, will be encouraged to negotiate through ACT. For its part ACT is hoping that Supercalc-II, to be enhanced with graphics next month, will do for the Apricot what Visicalc did for Apple II in the 8-bit generation of micros – sell cheaply and in bulk.

ACT also plans to repeat its successful strategy with the Sirius: to take a large share of the newly-emerging market quickly before IBM lumbers on to the scene and cleans up.

As with its operating system MS-DOS, Microsoft has a head start in having IBM adopt its Multiplan. The contention for supremacy in 16-bit applications is likely to be no less fierce than it has already been in systems software.

*CROSNO . . . "We are all being forced into the publishing game".*

ACT realises that its Sirius is being overhauled by the PC and reckons to buy time with the Apricot, calculating that the IBM low-priced Peanut will not hit Britain until the spring. The Apricot will be shipped in October from the new Scottish factory – ACT's first venture into independent manufacturing – and it will have the range of Sirius programs at its disposal, as well as Sorcim's.

A quick impact is vital, says Brian Androlia, joint managing director of ACT's software subsidiary Pulsar.

Mike Crosno, vice-president of Sorcim, commented: "Micro software has been a cottage industry run by a clique of engineeers. But now we are all being forced into the publishing game."

ACT has been in search of West Coast partners for a while, not wanting all its eggs in one basket, so this could be the first of a string of such international contracts. It now has non-exclusive rights to sell Supercalc through its outlets in Hong Kong, South Africa and Australia.

ACT turned over £22 million last year up 172%. Sorcim's claims are not widely disputed: it alleges a 250% growth rate and tripling of staff in 1982 to 90. But the avowed aim of becoming number one will take a little help from some muscular friends.

# Gosh – a charter for games

by Philip Hunter

GAMES software houses have clubbed together to bring discipline into the consumer software market. Inaugural members of the new Guild of Software Houses (Gosh) include Virgin Games, Bug-Byte, New Generation and Softek. Gosh has issued a charter for dealers, and promises to deal severely with errant members.

But Tony Lewis of the Computing Services Association thinks Gosh will have difficulty gaining credibility with dealers and customers.

How he asks will Gosh convince customers that offending members will be punished at this early stage while new members are being sought?

Gosh membership will cost £500, compared with £300 for small companies to join the CSA. Gosh treasurer Dougie Berne thinks there is a need for a Guild committed to software houses in the consumer market. But Berne hopes the Guild will attract other than just games software houses.

Lewis however thinks this unlikely. And David Blandford, sales director of commercial software house MicroProducts Software, thinks Gosh will not appeal to companies selling mainly within the industry.

"The aims are entirely laudable of course," says Blandford. "They are entirely in accordance with our own aims."

# BCS backs war on 'pirates'

by Claire Gooding

THE British Computer Society is putting its name to a new scheme to defray the costs of legal action against software thieves.

Insurance firm Bowring has joined the BCS in offering an insurance deal which will enable victims of piracy to be bolder in pursuing offenders. The BCS has negotiated the one-year pilot scheme for fellows of the society – about 1,000 of its 27,000 members – whose premiums will be paid by the BCS.

Many companies dared not take action against "pirates" in the past because of the costs. Even major software houses have had to resign themselves to illicit use of their software.

A further complication is the still indistinct law on copyright, which discourages companies from starting proceedings even if they have gathered evidence.

The Bowring policy gets round this problem by covering expenses where solicitors agree there is a "reasonable chance" of a successful outcome. "Obviously it's a problem," said the director of Bowring Professional Indemnity, David Blackburn. "What we don't want is to get involved in disputes which are about personalities and not about licensing," he explained. "Provided there is an identifiable and significant case we would back the client. The uncertainty of the law has to be accepted."

Bowring will depend on the advice of solicitors as to what is a "reasonable" case.

The ability to insure against legal expenses may well encourage companies to take the initiative and prosecute.

Ironically in the past such protection has only been available to those being sued, as part of professional indemnity insurance.

"This policy is almost the reverse of professional indemnity," said Blackburn. "It means firms can actually go on the offensive."

# Packages adapted for Unix

MORE applications for the Unix community have appeared on the market from Goldcrest Computer Systems.

Goldcrest specialises in business applications written in Cobol, and has adapted its packages, written in Micro Focus Level II Cobol, to run under Unix.

Unlike much Unix software which is released too early in the rush to cater for the fast-growing Unix user base, Goldcrest is claiming that its packages have been thoroughly tested in a "live data environment". The Unix suite includes order processing, invoicing, stock control, sales ledger, purchase ledger, nominal ledger, and payroll. Modules can be used individually or as a complete system. Goldcrest previously dealt in the CP/M market and is now concentrating on Unix as the 16 and 32-bit vehicle for the future.

Goldcrest will have the same network of dealers which it used to sell its Cobol packages under CP/M, but also intends to sell directly. "Ostensibly we'll be doing the marketing ourselves," said director Charles Hartnett, "though we are looking at dealers and intend some OEM deals."

The Goldcrest packages already run on the Pixel 100AP machine, and there are plans to implement them on other Unix systems.

# Technical guidelines for regions

by Caroline Burgess

THE Microelectronics Education Programme has set up a unit to coordinate the activities of its 18 regional software development groups. The new unit will offer technical guidelines and advice on subject material.

The unit will consist of a small team of technical and curriculum experts under the management of John Coll, until recently manager for education services at Acorn. He was also a consultant to the BBC computer literacy series and wrote the guide for the BBC micro.

"My task will be to make sure that software development teams and publishers get the advice they need to produce material to the highest possible standard" said Coll. "I also want to ensure that information about software is available to end users – the teachers – as quickly as possible".

The Microelectronics Education Programme was established in 1980 with the aim of giving schools and colleges a better understanding of the potential of microelectronics.

The work of the Microelectronics Education Programme is divided into three areas: software development, teacher training and information dissemination.

*Software File is compiled by George Black*

# Bumper year for Sydney

by John Riley

CANADIAN software company Sydney Development Corporation, which acquired UK software developer S.P. Support last year, has had another bumper year, with turnover up 138% to $11.5 million.

This is $2.5 million more than the forecast by Tarnie Williams, Sydney's president, earlier this summer.

The company is expanding rapidly, and last year's turnover represented a 750% increase on the previous year. Net earnings were up 135% to $1.3 million.

Sydney's UK subsidiary, Sydney Development Company (UK), which sells project management systems, was on target, with 1983 fiscal first quarter sales higher than the previous year's total sales.

Sydney's acquisition of S.P. Support, which specialises in developing mini and microcomputer software packages, is part of the company's long-term strategy of growth by merger. According to Sydney, S.P. Support gave it a European development centre which can make cultural adaptations to its North American software, or vice versa.

*WILLIAMS . . . "Business penetration in the US disappointing."*

The company also acquired Canadian and American computer games companies. In his message to shareholders, Williams said that market penetration in the US had been disappointing: "The US market continues to be our major challenge," he said. "Business software sales to date have not met our expectations."

Last March, Sydney appointed Brian Josling as executive vice-president. Josling was formerly senior vice-president of CBS Records Canada, where he had direct responsibility for the retail and rack-jobbing divisions and for distribution – "a field very similar to that into which we foresee the packaged software industry developing," said Williams.

# Superbrain maker's sales take a tumble

by John Riley

INTERTEC Data Systems, the South Carolina-based maker of the Superbrain microcomputer, last week reported a 33% drop in net sales for its first quarter sales this year, compared with the equivalent quarter last year.

The company, which recently laid off 30% of its manufacturing force, had net sales of $2,998,545 compared with $4,452,420 for the same period last year. The earnings per share have dropped 13 cents and the company reports a net loss of $631,368.

A company spokesman said: "The mainframe and minicomputer vendors are coming into the market more now, there are bottlenecks in our distribution and our new product is delayed."

The company is optimistic that its new micro – a "state-of-the-art" machine to be launched in September – will more than compensate for this year's losses.

Max Hughes, managing director of Icarus, which distributes the Superbrain in the UK, said: "We have been disappointed by our Superbrain sales but they have not been much below our targets. The 8-bit machine is a degree out of fashion, but that is not reflected by its power.

"The customers think it's out of date, but that's not true. The 16-bit world is only just getting its act together," he added.

Hughes hopes to take the new machine, which is expected to be in volume distribution by the New Year, and Intertec intends to expand the number of its dealers.

# Harris income slumps but UK 'above target'

by John Riley

COMMUNICATIONS and information processing equipment manufacturer Harris Corporation is the latest in a string of technology companies to report a drop in income. Year-end fiscal figures announced last week showed fdurth quarter net income to June 30 fell 19% on the equivalent quarter last year to $11.7 million.

Net income for the year was $55.9 million, down 26% on the previous year. But sales increased 8% to $1.42 billion from $1.3 billion.

Joseph Boyd, Harris Corporation chairman, reported that the company's information and communications systems sales were "off due to depressed demand in foreign markets", that government systems sales and profits were up "sharply", and that the semiconductor side of the company was profitable for the second half of the year.

The company's UK operations all exceeded expectations. Mike Baker, marketing manager for the UK subsidiary, Harris Systems, said earlier this week: "We in the UK were above target in all divisions, including our minicomputer and terminal divisions."

Harris's R&D expenses were up 21% to $273.6 million, and of that figure, $90.6 million was raised internally, and $183 million came from customers and government agencies.

Boyd expects operating results, which dropped 7% to $50.3 million, or $1.60 a share from last year's $1.74 a share, to improve "significantly" in fiscal year 1984.

# IBM raises stake in Intel

by John Kavanagh

IBM has increased its stake in US microelectronics firm Intel from 12% to 13.7%. The 1.84 million extra shares were bought on the open stock market at a cost of about $71 million.

IBM took its initial stake in Intel in a $250 million deal in February. It agreed then to limit its investment to no more than 30%.

That original investment is now worth over $480 million on paper, and IBM's total shareholding is valued at more than $550 million.

Intel welcomed the latest move, which gives it extra capital and a boost on the stock market, while preserving its independence.

IBM said Intel was "a good investment". The IBM Personal Computer is an Intel chips.

# Security kit to be offered free by Alpha Micro

by Claire Gooding

IN a rare move to protect its software satellites, manufacturer Alpha Micro is to supply a Software Security Device free with its machines.

Alpha Micro already uses the security device to tie proprietary software to the machines on which it is supplied.

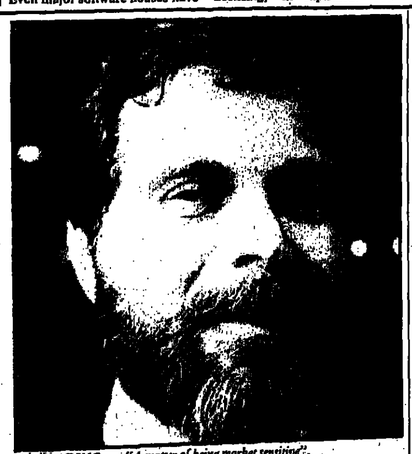
The device is of the sort usually known as a dongle: a hardware plug which plugs in at the back of the machine. The software has to contain a code which corresponds to that held by the dongle. Without the dongle the program cannot run, and ensures that no unauthorised copies can be made.

It is unusual for a hardware manufacturer to take steps towards software protection, which is generally regarded as a problem for software houses and suppliers.

We are primarily an OEM, but to survive on the applications front to the public through dealers," said Les Palladino, marketing director of European operations. "It's a matter of being market sensitive, and we recognise the growing importance of software houses. It's time lots more manufacturers became sensitive to the needs of their software suppliers."

The Software Security Device is supplied as standard kit with every AM-1000 desktop system and AM-100/L system. The individual code numbers will be burned in at the US plant in Irvine, and it will be up to the software suppliers and dealers to make sure that all packages are adapted to correspond with the buyer's security device. Two chips are supplied in case of failure.

The companion product, the SSD-Simulator is supplied free to third party software developers so that they can incorporate protection into their products.



*PALLADINO . . . "A matter of being market sensitive".*

# Omac faces challenge from Cincom

AS ICL seems at last on the brink of getting its act together for the manufacturing market with its Omac-29 system, a challenge is emerging from top US software house Cincom.

Omac has had a troubled history, but ICL is said to be on top of its problems now and is preparing for a big push into the production control field.

ICL's Omac-29 is quoted as having some 140 users worldwide, but the firm has lost its early lead through delays and rewriting hitches. A satisfactory VME version is rumoured to be still at least a year away.

Now Cincom has produced a new version of its MRPS manufacturing system for the VME environment. MRPS was designed for running on IBM hardware under CICS and was then adapted for DEC and for ICL's DME, using Telecomputing's monitor TPS. Cincom says it has one sale of the DME version and one of the VME version, but marketing manager Graham Burton said they were aiming at the VME user mainly.

Meanwhile ICL's new policy of co-operation with independent software developers had led to agreements with several Omac enhancers.

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**PROFILE**

# The boss who tired of the corporate lifestyle . . .

FORMER IBM vice-president Dick Williams' appointment to Prime as its European boss is more than a typical high flyer's mid-career move. It is refreshingly unique – for he took four years off from the computer industry between the two jobs.

After 20 years in IBM, during which he became vice-president of European operations, General Business Group, Williams left the company to go into real estate development in Florida.

"I was tired of the corporate lifestyle, wanted more time with my family, and more time to think," he explains.

Although successful in his semi-retirement in Florida, he began to find small business parochial: "It's

**by John Riley**

hard to walk away from the international environment and there is an excitement about the computer industry," he says.

"I had always found it difficult to believe that I could be happy in any company other than IBM, and if I had been approached two years ago I wouldn't have moved," he says.

The offer from Prime earlier this year to become its vice-president Europe, Middle East and Africa marketing operations was the right job and came at precisely the right time, he explained.

The four years away gave Williams a clear perspective on the industry. "I can focus on the industry better than when I left," he says. "I don't know if it was a question of cleaning out the cobwebs or just that I feel more comfortable in a smaller company."

After graduating from Michigan State University in Business Studies and Economics, Williams joined IBM back in the electromechanical age. He then worked in systems analysis and procurement with one of the earliest computers, the IBM 650, and helped to develop one of the early integrated manufacturing control systems based on the IBM 1400 system.

Looking back on the progress of the industry since then, he identifies two major revolutions, in both of which he was involved. These were, firstly, the change from batch to real time with the recognition of the inherent need for communications; and secondly, distributed data processing.

Williams started to pick up the need to "drive intelligence downline" from customers in the banking industry during a spell in Paris. "We recognised that thoughtful customers were asking for things they needed and were no longer content to take just what was available."

After a posting to the US he found himself back in Europe as general manager SE Europe bringing DDP to the finance industry – "implementing decisions I had strategically dictated."

Over the four years Williams has been out of it, he does not believe that the computer industry has changed dramatically: "The observed evolution of industry trends apparent four years ago are still

*WILLIAMS . . . "An excitement about the computer industry".*

appearing".

As an observer on the outside he was struck by the "tremendous impact that the industry has indirectly on the younger generation."

Looking into the future, he thinks the most significant trend will be a de-emphasis of hardware. "Successful suppliers will move further away from the emphasis on hardware and will become integrators providing systems solutions. And customers will develop the capability to become innovative."

Williams welcomes the challenge of working with a smaller company. "I can have my arms round the problems in Prime," he says, "and am better able to be my own strategist and implementer as opposed to having these as separate mind frames in IBM."

When asked how he regards IBM now that he is competing with it, he replied that he maintains a "tremendous respect" for IBM.

Growth and its management is a subject that concerns Williams. Several companies are experiencing some slowing of relative growth and he believes that change "requires change in the way companies manage".

And how does he find living in the UK? He enjoys it and finds that his hobbies, golf and fishing are both "acceptable here – although you can't fish where you want."

**DOWNTIME**

# Women get Wise to Wages issue

1984 is to be the year of the high tech woman. A campaign will be aimed at sweeping away the cultural and social barriers that keep women out of the plum jobs in computing, science and engineering.

At a stroke the shortage of specialists can be cured, or so we are told.

We at *Computer Weekly* were a little puzzled to see that the name of the campaign had been changed from Wages to Wise. Now, Wages stands for Women And Girls into Engineering and Science, while Wise is an acronym for Women Into Science and Engineering.

Is the campaign no longer aimed at girls? Or was the name changed because women, in this enlightened feminist age, do not like being called girls anymore?

Feeling an itch to know, I phoned Wise. A young woman there was happy to tell us that girls are still very much alive in the campaign, and that the name change was made because Wages makes people think of money.

Wise is far wiser than that.

## Getting to the bottom of it

DIGITAL EQUIPMENT is faced with a deep-seated dilemma. The company – or to be more exact one of its OEMs – has sold the Ford Motor company a computer system to assess the comfort of seats in a range of commercial vehicles. A PDP-11 mini will calculate the seat curvature, seat suspension and vehicle suspension most conducive to a smooth ride.

Data will be gathered from devices placed in a specially designed seat called a Sit-Bar, an acronym for the memorable name Seat Interface for Transducers indicating Body Acceleration Received.

Sit-Bar has a flat upper surface on which the test driver sits.

But the secret lies in the lower part, which is modelled to represent the shape of an average pair of human buttocks when seated.

Here I believe lies the weakness of the whole scheme. Accurate measurements are being taken and analysed, but the whole exercise could be doomed to failure because there is no such thing as an average pair of human buttocks.

The perfect seat for Cyril Smith would not fit Twiggy, for example.

## In reverse order

FOLLOWING *Computer Weekly*'s astounding revelation that Sorcim – the Californian software house which gave the world the Supercalc program – is actually Micros spelt backwards, we announce our latest world-shattering competition for similarly reversed names within our industry.

The more significant they seem the better we shall like them – SOMNI, for instance, gives a flavour, perhaps, of the aura of Inmos. Failing that topical anagrams will be welcomed.

See what you can come up with.

## Lean times

IBM housewives in South-west Germany have become a nuisance to the local community of butchers.

The Germans are fond of their food, in particular their pork and the fat of their meat. And many sport pot-bellies to prove it.

But the IBM women have been causing trouble by demanding lean meat. Their husbands, they claim, have a slim, trim corporate image to maintain.

I wonder if the quality of their corporate lunches may not have more to do with it.

## Coming to terms

ASKED only the other day to furnish yet another definitive definition of some obscure computing term – "*DP Manager*", I think it was – it occurred to me that those in computerland have been without the inestimable benefit of my deliberations on matters lexigraphic for some little time.

Here then are four pearls of wisdom:

If it's there and you can see it it's REAL.

If it's there and you can't see it it's TRANSPARENT.

If it's not there and you *can* see it it's VIRTUAL.

If it's not there and you can't see it it's GONE.

## Root of the matter

THOSE who visit Scotland next summer may be surprised by the number of Scots to be found there. Reliable estimates suggest twice the usual number in the Glasgow area.

The reason for this expected influx is that a computer is being set up to help trace their ancestral roots. The service will be available at the Roots Centre, a museum being established in Glasgow.

It is aimed particularly at emigrant Scots who want to come home and find the true colours of their tartan.

By next summer data will be available on 15,000 Scottish surnames, as well as related information on tartans, clans and the folklore.

The Scottish Development Agency is circulating publicity on the new database in the US, where about 50 million people can trace a Scotsman perched somewhere in the family tree.

The Roots Centre could be in for a busy time.

## Mark my words

IN view of the mounting irritation about the proliferation of trade-marks™ in every piece of computer documentation we read, enough is enough.

We are considering making trademark™ a trademark™ blocking up all the trademarks™ and all the space where the small print used to go.

*Chad*

**PLATFORM**

# Piping information software into the home via the TV set

JUST as the forces of technology moved us toward centralisation and mass production in the first half of this century, new technological developments in communications will free us to use our productive energies on a more decentralised basis.

Evidence of the shift towards decentralisation already can be seen in new forms of television programming. The emphasis on mass appeal is diminishing.

Concurrently, there is demand for immediate access to information services. As our society moves away from centralisation, the importance of delivering information to the home increases significantly. Satellite Television Corp is at the forefront of the technological progressions that are enabling these societal changes and is developing a new television system that will allow the company to respond quickly and efficiently to evolving trends in entertainment and information services.

Until the mid-1970s, American consumers had limited viewing options. Programming and scheduling conformity were commonplace. With the advent of satellite-delivered cable television programming in 1975, a whirlwind of change swept across the country. Instead of the same conventional fare, viewers were offered a host of new programming options.

The response of the television viewing public has been overwhelmingly positive. With the delivery of programming diversity to the homes, consumers expect more than ever before from their television sets.

As the age of information progresses, the constraints of time and place are loosening their grip on the American consumer. For decades, the typical American has been bound to a way of life in which the watch and the automobile reign supreme. A dependence on mass production made it necessary for people to gather together in one place at the same time in order to maximise production.

But transportation costs are escalating and the amount of time wasted commuting to and from work is increasing. It is apparent that the system of centralisation is not as cost-effective as it once was.

With advances in telecommunications, the system can be decentralised by establishing home communication centres.

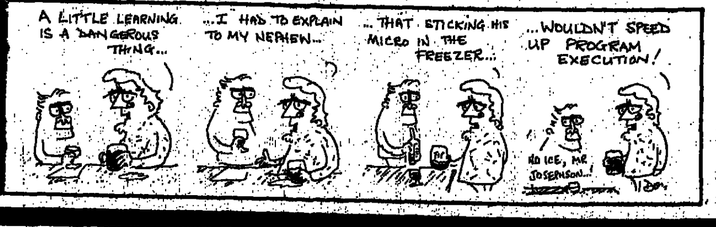
With Direct Broadcast Satellite, information software can be piped conveniently and cost-effectively into the home. By linking the television to a home computer, complete with word processing capability, the home will have an advanced electronic system comparable to a modern office. Through these innovations, a system will evolve by which individuals can develop and use their talents whenever and wherever they wish.

**This Platform is extracted by *Computer Weekly* from comments written by Richard S. Bodman, president, Satellite Television Corp, a wholly-owned subsidiary of Comsat.**

## 10 YEARS AGO

**FROM COMPUTER WEEKLY OF AUGUST 23, 1973: IBM decided to move into the point-of-sale market with the 3650 retail store system . . . Thorn Electrical Industries and GTE dissolved their partnership in Thorn-General Telephone . . . Minister for Industry Chris Chataway sat at the console of a Honeywell 6060 and set in motion the final test program on the first Series 6000 machine in the UK.**

*Liveware File by Don*




**ComputerWeekly**

Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS

Thursday, August 25, 1983

# A network tied up in red tape

A SIMPLE red adhesive sticker appears to be the main stumbling block on the road to liberalising the British Telecom network.

The red sticker is required for all devices which are capable of being attached to the public telephone network. It is a sign that the equipment has been tested, evaluated and approved by the British Approvals Board for Telecommunications: without the approval, suppliers are liable to be prosecuted by any member of the public or by the Department of Trade and Industry.

Two years after the formation of the BABT only one device, a telephone, has received its approval. The board was set up in 1981 when the government published its Bill to separate British Telecom from the Post Office and announced its intention to limit Telecom's monopoly.

The Secretary for Industry was given the power to approve or disapprove equipment for attachment to the telephone network and also to licence added value services and the resale of transmission capacity. The BABT, an independent body acting in conjunction with British Telecom, was to co-ordinate the approval process.

At the time the Board was seen as a device to speed approval for equipment and avoid any possibility that Telecom would use the approval process to maintain its monopoly contrary to the intention of the government.

In November 1981 it was announced that telephones and discrete modems could be submitted for approval, with other types of network attachments being accepted from the following July. A full set of standards for all attachments to the network was promised for July of this year.

The cold facts are that still only one telephone has successfully completed the approval process and that standards for PABXs and more complex exchange and data equipment have yet to appear.

The problem is that few of the companies which were expected to be queuing for approval seem to understand the system, and the BABT itself seems to be excruciatingly slow.

Last week a small UK company launched a portable mail and telex terminal on the market in hopes of taking advantage of the new liberalisation policy. The irony is that although the product was developed with "substantial" Department of Trade and Industry backing, and is to be distributed in conjunction with Telecom Gold, British Telecom's electronic mail service, the product does not have BABT approval.

BCD Telemail, a small Tunbridge Wells company which developed the terminal, says it has applied to have it tested but not actually submitted the device for testing. The company believes that the BABT actually has to ask BCD to send the terminal in for testing.

BABT says that BCD is on its list of enquirers, but no application for approval has been submitted. If the device had been submitted, its chances of rapid approval seem slim. According to the BABT, a very small proportion of the equipment submitted to it complies with the standards (only one telephone to date); but a number of devices are being re-submitted after making required modifications – a process that can only lengthen the approval process.

P&P Marketing in London is the UK distributor of the BCD Telemail terminal. P&P has an agreement with Telecom Gold. It would seem logical that BT might have given some pointers as to how the companies should go about obtaining BABT approval.

Not so. Telecom Gold says that getting approval is a matter between the companies and the approval board. It deliberately doesn't want to get involved in the approval process for fear that it would be seen to be interfering.

DoTT departments have to fall over backwards to be seen to be independent. There is even separate funding for the approvals board. British Telecom takes a similar view, which it says it always made clear to P&P.

P&P says it understands that merely applying for approval is an acceptable way of bringing the product on to market. The company also points to its close relation to DoTI and British Telecom. The company doesn't envisage any problems.

It may not have any problems, but there does seem to be a clear message to the government and the BABT. Telecommunications is to be one of the country's major growth industries. How about getting your act together as far as the communications side goes?

Too many people seem to be working in the dark.

## 1984 and all that . . .

THIS week's example of the strange things people say about computers was sent in by G. W. Hart of Orpington, Kent, who gets £5.

A traveller wanting to avoid the sun on a curtainless Inter-City train from King's Cross to Newark asked to reserve a seat on the left-hand side of the carriage. "Ah no, sir" he was told. "Smoker or no smoker, facing the engine or back to it, but the computer cannot tell its left from its right."

*The Times*

**LETTERS**

# Private firms must be coaxed by 100% funding

NUALA MORAN reported Sir Clive Sinclair as saying "We need a national sense of humour(?) to hammer out a massive silicon foundry among these people" (*Computer Weekly*, August 4). Earlier, he said that "If we don't make chips we've had it. I think I'll emigrate."

Sinclair reported in similar vein to both the Alvey Committee and to the House of Lords Select Committee on Science and Technology: "As the computers of the future move away from the Von Neumann architecture towards increasingly parallel modes of operation I foresee the need to imbed processing capability in memory, and only companies able to produce (their own) CMOS chips with $10^6$ or $10^7$ devices in large numbers and at high yields will remain competitive."

Sir Clive is on the crest of a wave of success, and yet he talks of emigrating. I think he is right to do so.

I predict that the government decision makers will ignore Sinclair and take advice from those very people in GEC, Ferranti and Plessey who presided over the disintegration of our semiconductor industry.

When I worked in Motorola (Phoenix, Arizona) in the 1960s developing the most advanced integrated circuits in the world, no one dared to talk of the government reducing their funding of our work below 100%. No one will do this work for 50% or 33% support, and no one ever has. Companies like GEC, the big dying dinosaurs, may take a 50% government-funded project and then boast internally about how their clever accountancy has boosted the real support up to 100% and above support by government.

The companies of the future, the ones with a chance of producing something useful rather than merely burning up the government support, do not have squads of accountants to increase an apparent 33% or 50% government subsidy up to 100% and beyond; they do not think on those lines.

If, as seems likely, the government pulls back to support at low levels like 50%, then their funding will merely be the latest slush fund to keep the old, dying, lazy monsters alive for another decade. Nothing positive will come of it.

It is time people began to realise that, in the US as well as here, private industry is so hostile to the idea of developing its new, future products that they need at least 100% funding support to be coaxed into doing it. Otherwise they would prefer to die.

I have worked on dozens of products in microelectronics and in computer hardware, in Britain and the US, and for the last 20 years I have come across virtually no case of major new product development in high technology which did not carry far more than 50% government funding.

The government gets most of the profits back in taxes. Why does it refuse to put in money up front?

**IVOR CATT**
**St Albans.**

## Neil Kinnock's figures

IN your wide-ranging article Kinnock lashes education strategy (*Computer Weekly*, August 4), you quote several figures attributed to Neil Kinnock.

Without wishing in any way to lessen the urgency for tackling computer training, I question the scale of the shortfall of trained staff and the output of trainees given: ". . . demand for 30,000 skilled workers, but trainees were only being output at the rate of 1,500 a year . . .".

No two estimates of shortfall agree but about 15-17,000 would seem to be more realistic.

Polytechnics and universities will produce about 5,000 academically qualified computing personnel this year, and the Computing Services Industry Council (Cosit) is grant aiding 400 trainees in employment. In addition, there are some 4,000 Tops computing trainees plus 250 sandwich course students grant aided by the MSC. However, in computing, as there are no widely accepted qualifications or certificates of competence, the real test of employment is the ability to do a job and that of course pre-supposes a person has been employed and trained.

The national need is to make all employers of computing staff aware of the importance of recruitment and training, and that they have a responsibility to take on and train staff.

Currently too few employers are prepared to make this crucial investment because of the fear that, having spent time and money training competent staff, they will be "poached" by other companies which only recruit "experienced" personnel.

**GORDON EWAN**
**Director**
**Cosit**
**London WC1.**

## Trying to get a start

I READ with great interest your recent articles on education and training.

For some time now I have been trying to get a start as a trainee programmer, after successfully completing a Tops programming course. So it was somewhat demoralising to read that the computer industry is short of some 40,000 programmers and analysts.

I have written about 150 letters of application, and from my point of view there seems little evidence that the industry is doing anything significant to alleviate its "biggest problem."

Many people would agree that the best form of training is done on the job, where individuals become familiar with the actual systems on which they will be working. So why don't firms, which must have the foresight to see their own potential expansion, train staff to fill the positions that they will have considerable difficulty filling if they choose to get a programmer "off-the-shelf", given that the shelf is empty.

I hope I find something soon before I despair of starting in an industry supposedly so short of staff.

**A. A. WILLIAMS**
**London N22.**

## Closed door

AS an ex-Tops course Cobol student, I would be interested to know what outlets there are for mature trainee programmers anxious to get a foot on the rung.

I have been working in data control/computer operations for the last two years, and very much want a future in programming. It seems to be a closed door.

Can any readers suggest how I might achieve my ambition?

**PATRICIA HARRISON**
**Wimbledon.**

## Super performance

IN COMMON with many articles on supercomputers, the article by Kevin Cahill (*Computer Weekly*, August 11) quotes grossly erroneous performance figures for these machines. To set the record straight, the Cray 1 peak performance is slightly less than 140 Mflops with typical figures from 20 Mflops upwards.

The Cray XMP is a multiprocessor (two CPUs) each of which is approximately 30% faster than the Cray 1. Its maximum rate will not therefore be better than 400 Mflops. The figure for the CDC Cyber 205, of 400 Mflops, is the asymptotic rate for 64 bit words, but 32 bit words have an asymptotic performance of 800 Mflops.

Of course, all of these machines achieve these high computational rates only when operating on vectors.

**C. R. JESSHOPE**
**Lecturer - Electronics**
**Southampton University.**

## Comms Year

IN the Leader column (*Computer Weekly*, August 4) you correctly identified the lack of public awareness of the designation "World Communications Year". In the last sentence you raised the question of whether anybody outside the United Nations General Assembly believes in the value of telecommunications.

I am pleased to report that the answer is an emphatic Yes. As the promoter of a communications seminar to be held later this year I can confirm that the public is very aware of the value of communications, be it speech or digital. The only problem area is to be able to obtain some impartial advice without having somebody sell you something.

The solution to this problem is easy – just ask for a brochure!

**PETER DICK,**
**Computer Age Systems**
**Wallingford**
**OX10 8NN.**

**Two dates to remember**

The importance of software in the computer market place, as the part of a computer package that actually brings the system alive and meets the customer's applications has never been greater – that's why you should make a diary date now not to miss two very important events:

**NOV 15-18 '83**
*Software Village*
at
**COMPEC '83**

1: First is the Software Village at Compec '83 which is greatly expanded on previous years and will be an integral part of the Show in the West Hall section of the Grand Hall, Olympia, London. November 15 – 18 1983.

**JUNE 5-7 '84**
**software '84**

2: The second is the recently announced new Software '84 exhibition and conference. A show devoted entirely to the subject of business and professional software at Earls Court, London, June 5 – 7 1984.

Both shows are organised by Reed Exhibitions, the country's largest business exhibition organisers, and sponsored by Computer Weekly and Software in association with Systems International, Practical Computing, Micro Business and Computer Talk.

For more information contact the Exhibition Manager Compec '83 or Software '84, Reed Exhibitions, Surrey House, 1 Throwley Way, Sutton, Surrey SM1 4QQ. Telephone: 01-643-8040

# BCS in bid to convert trainees into specialists

CONVERTING the abundance of enthusiastic apprentices into experts in fields like real time programming is a major problem in the computer industry. But at last it looks like something may be done.

The British Computer Society is ready to move ahead with its Professional Development Scheme which it hopes will tackle the imbalance between trainees and specialists.

The scheme was set up to develop a national training policy for people who already have degrees, or some experience. The BCS Council has voted approval – and cash – for detailed plans to be prepared.

The BCS' Tom Umpleby, a member of the working party for the scheme, said there would be three parts to the training: general education, more specific training in individual skills like real time programming, and job experience.

The training could take place during the early years of a career and should blend with the present BCS examinations.

The BCS has just completed a survey to find what people think of the strategy. Opinion was sought and obtained from just about everyone who is anyone in the industry. The list includes the National Computing Centre, the Computing Services Association, the Manpower Services Commission, the Departments of Industry and Environment, colleges, universities, local government, ICL, IBM and representatives of many smaller companies.

Umpleby describes the overall response as positive, and plenty to encourage the BCS to move ahead firmly with the final phase of the scheme.

The BCS must sell the scheme to several groups of people, says Umpleby. Individuals must be convinced that the certificate will make them more valuable to employers.

Employers must have a similar conviction and also be willing to help with the scheme by releasing staff for training. And universities, polytechnics and organisations with training facilities will have to donate some of their man hours.

Much organisation and publicity will be needed to make the scheme a success. But Umpleby maintains that it is just an evolution and unification of the BCS' present schemes.

One of these is a model degree course for data processing, first published by the BCS in 1976 and revised since. "This has been influential in getting courses revised," says BCS education officer Kay Kehoe.

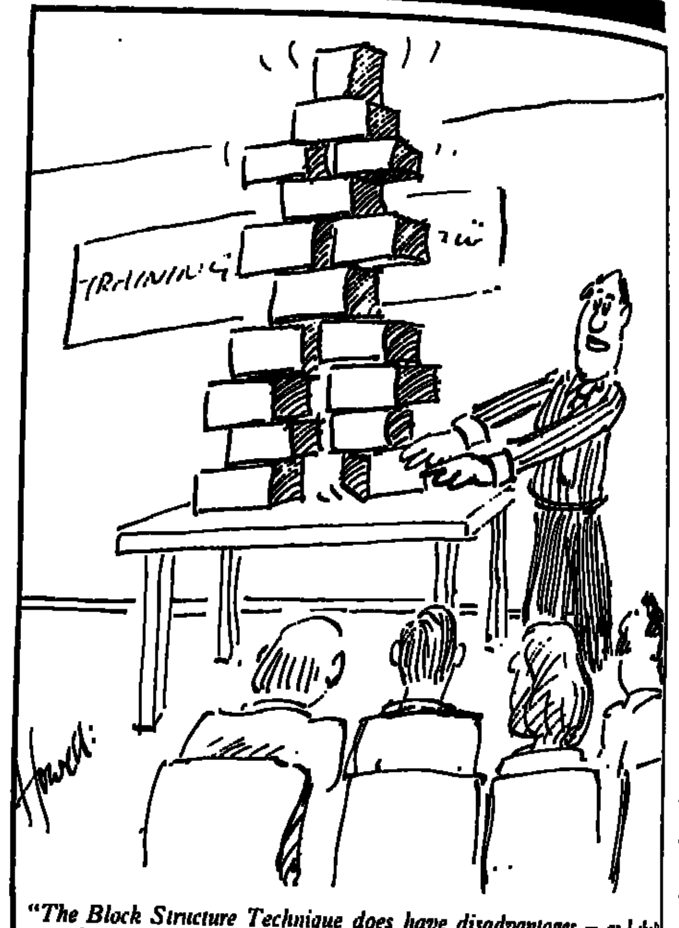
The idea was to develop a degree course concentrating more on commercial data processing needs than does the conventional computer science course. Several organisations have taken up the idea, including Huddersfield Polytechnic, Bristol Poly, Brunel University and Leeds University.

According to Kehoe, these courses are not an exact match of the BCS specification, but are close enough to merit approval; they also give partial or complete exemption from BCS exams.

In systems analysis training, the National Computing Centre is very active. One of the centre's first moves was to collect a group of companies and start a six-week course, with the blessing and support of the BCS.

The centre and BCS have just agreed a new syllabus for the course, taking account of design methods like Yourdon and Jackson Structured Programming.

The course is not for beginners, but for computer science graduates or programmers who after a year or two at the coding bench, want to move into systems analysis.




*"The Block Structure Technique does have disadvantages – as I shall now demonstrate".*

*PFS thrives on the threat of disasters.*

# Firm that thrives on disasters

SMALL firms wanting to buy their first computer have until recently found independent advice hard to come by. But as the industry matures, more trouble-shooting consultancies are offering this service in addition to their more lucrative work for established computer users.

One such firm is Project Facilities Services, a fast expanding outfit which has just opened new headquarters in Nottingham. PFS will appeal mainly to large mainframe users, but claims to be equally at home helping out a small firm confused by the seemingly endless array of identical-looking plastic boxes to choose from.

After all, as director Derek Wadham says, people can – and it is hoped will – come back for more involved studies after an initial consultation.

"We like to consider that we offer a complete consultancy and advisory service," says Wadham. This includes feasibility studies, as well as help with the decision on which computer to buy.

PFS also thrives on computer disasters, or more accurately the threat of them. The company has written disaster recovery procedures, and Wadham says he has been asked to give a presentation on disaster standby and security to the IBM Computer Users Association.

PFS will suggest what level of security is appropriate for a particular installation. The most expensive option is to have a second computer gathering dust in the cupboard ready to take over. The high cost of prolonged downtime might make this feasible for big banks, but a cheaper alternative is to use one of the mainframe recovery services such as Failsafe.

Failsafe offers clients guaranteed time on its IBM mainframe when their machine fails.

"One of the questions we ask is: Can it be done manually?" says Wadham. If the work can be done manually for a while, then so much the cheaper.

Wadham and his co-director Neil Dennis worked for ICL's software division (formerly Dataskil) before forming the new company.

## PUZZLER

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GIVEN just one of the figures in this skeletal division-calculation, you are asked to reconstruct the complete sum. See page 39 for solution.

*Workplace is compiled by Philip Hunter*

*■ STEPPING into a single-seater racing car at Silverstone's Grand Prix Circuit was dream come true for Richard Gee, 21, from Broadstone, Dorset, a computer operator with Barclays International at Poole. He is one of 20 finalists in the Marlboro Challenge – the search for new British motor racing talent – who are training for the competition's final at Brands Hatch on September 13 and 14. Gee, an enthusiastic sportsman, has always had an interest in motor racing but had never been on a circuit before he accepted the Marlboro Challenge. He has two more days of training to complete on August 29 and September 3.*

■ To head the newly-formed Information Services Division, National Provident Institution has appointed **Brian Blake**. As assistant general manager (information services), he will be responsible for NPI's computer systems, computer operations, organisation and methods, and telephone, printing and typing services. Blake joined NPI in 1960 and in 1979 was appointed assistant divisional manager (administration).

■ Hawke Electronics, a franchised Digital Equipment distributor, announces personnel changes within its DEC division. Appointed divisional manager is **Steve Kearns**, formerly product manager for Hawke's Texas Instruments franchise. Prior to joining Hawke in 1982, **Kearns** was with Decade Computers. **Colin Evans** formerly product manager for the DEC franchise becomes UK sales manager. **Malcolm Pallant**, 37, continues as technical manager while **Digby James**, formerly with Crellon, becomes part of the sales and product support team.

■ Twenty-six-year-old **Keith Holdstock** has been appointed chief electronic engineer for SML, the microcomputing company formed to exploit the products of Bath University's R&D. He was co-designer of one of the products originating from the University.

■ Memory Computer (UK) announces the appointment of **Roger Deards** (above) as turnkey systems manager. He is responsible for the newly-formed Turnkey Systems Division, which markets Memory's range of commercial software on Prime computers. Deards has been with Memory for three years as software and programming manager for Memory Computer Services.

■ Paradyne, manufacturer of high speed modems and IBM network communications systems, has appointed **David Houston** director of product marketing, Europe. He became the company's first European employee in 1980. Previously, he was European product manager with a Paradyne distributor.

■ Molecular Computer European Operations has appointed **Leo Lambert** as regional manager. He will cover all Western Europe other than Germany and Scandinavia, with Africa and the Middle East. He was formerly European business manager with Zynar, where he was responsible for running the German subsidiary and setting up distributors in other countries. Before that he was deputy managing director of Interscan Communications.

■ The Council of the British Electrical and Allied Manufacturers' Association (BEAMA) has appointed **I. M. Cleare**, managing director of Gilflex-Key, to the Standards Policy Committee, and **Peter Dillistone**, sales director of Arcolectric Switches, and **Wilf Robinson**, external relations manager, Ferranti Computer Systems, to the Publicity Advisory Committee.

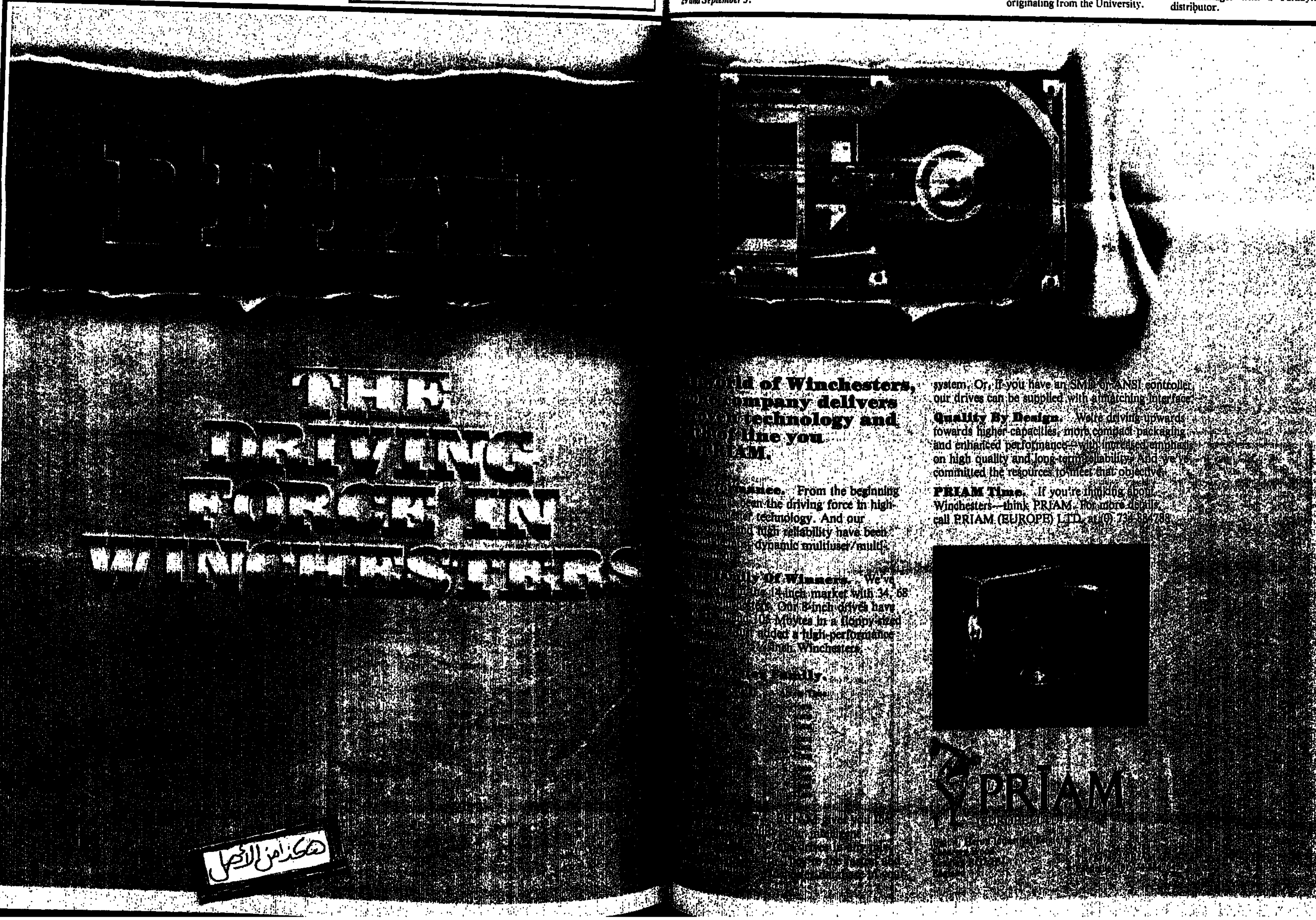
■ **Ian J. Orrock** is named as managing director of Racal-Redac. He will be responsible for all the international operations of the Racal-Redac group of companies, which has made more than 1,100 computer-aided engineering installations worldwide. Orrock, 36, joins Racal-Redac from United Telecomms of the US. He was managing director if its UK and European operations following the acquisition by United Telecomms of his own company, Computer Resources.

■ **Peter Fergusson**, managing director of Fergusson Computers, has been appointed treasurer of the Computer Retailers Association. Five years ago he formed Fergusson Computer Services to service and maintain Apple microcomputers.

■ **Nicholas Bate** has joined Peachtree Software International as a training consultant. He was previously courseware development manager for Comshare for 18 months.

■ **Fred Mascarenhas** (above) is named by Perkin-Elmer Data Systems as UK marketing manager with responsibility for the minicomputer company's marketing strategies throughout the UK. He joined the company in 1979.

*■ Three directors appointed to the board of Gresham Lion (PPL) are: **Dudley Reeves** (centre) managing director, who has been with the company for seven years and previously was divisional manager, **John Sturt** (right), sales director, formerly sales manager, and **John Phillips** (left) technical director, who has been with the company since its formation and was most recently technical manager.*




## DIARY

**AUGUST 30-SEPTEMBER 2**
The second International Conference on Database, organised by the British Computer Society and Universities of Aberdeen and Cambridge, takes place at Churchill College, Cambridge. Details: Peter Hammersley, Middlesex Polytechnic, London N11 2NQ.

**AUGUST 31-SEPTEMBER 1**
Improving Programmer Productivity is a practical workshop for trainee programmers with basic language training and initial experience. Run by BIS Applied Systems, it is to be held at the Park Court Hotel, London, and costs £270. Details: Cherry Bigmore, 01-261 9237.

**SEPTEMBER 1**
Are You Leaving Your Career to Chance? P. Hetquet, Electronic Recruitment Company, University Centre, Mill Lane, Cambridge. IEEE.

**SEPTEMBER 5-8**
IBM Cobol Review, a course organised by Altergo Education, takes place in London. Aimed at inexperienced Cobol programmers, it costs £450. Details: Altergo Education, 01-836 9303.

**SEPTEMBER 5-30**
Data Training's systems analysis and design course takes place in Holborn, London. Fee is £1,150. Details Philip Corker, 01-404 5444.

**SEPTEMBER 5-9**
Computer Training and Education Centre runs its Z80/8080 Assembler course at its centre in Clerkenwell Road, London. Further information from Richard Lee, 01-251 4010.

**SEPTEMBER 6, 7**
BIS Applied Systems is running the course, Team Management Leadership, for newly appointed project or team leaders. It will be held at the BIS Training Centre, London SE1. Cost is £285. Details: Cherry Bigmore, 01-267 9237.

**SEPTEMBER 7-9**
Implementing and Operating Local Area Networks is a seminar organised by Frost and Sullivan. It takes place at the Mount Royal Hotel, London, and costs £425. Details: Carolyn Budd, 01-486 0334.

**SEPTEMBER 12-16**
Programming in Pascal is a course run by Computer Training and Education Centre at its Clerkenwell Road, London, centre. Details: Richard Lee, 01-251 4010.

**SEPTEMBER 12-16**
Basic RPGII Programming is a course to be held by MSS Computer & Business Consultancy in Worthing. The consultancy is also running one- to five-day microcomputer and word processing courses at venues in London, Worthing and Sheffield, with fees of £125-£335 respectively. Details: Marcia Gay, Worthing 34755/6.

**SEPTEMBER 14, 21, 28, OCTOBER 5, 12, 19**
Computer-aided Circuit Design is a short, advanced pick-up course organised by Coventry Lanchester Polytechnic. Course fee is £60. Details from Carolyn Hall (0203) 24166.

**SEPTEMBER 15, 16**
Microcomputers in Banking is an international seminar to be held in Luxembourg. It is organised by Société des Foires Internationales de Luxembourg, Rue Alphonse, Weiker, 2721 Luxembourg-Kirchberg, BP 110, L2011 Luxembourg.

Reducing Human Error in Computer-based Systems is a Frost and Sullivan seminar at the Park Lane Hotel, London. Price is £385.

**SEPTEMBER 14, 15, 16**
Office Automation and Integrated Information Processing Support Systems is a Frost and Sullivan seminar taking place at the Hilton Hotel, Amsterdam. Cost is £425. Information from Carolyn Budd, 01-486 0334.

COMPANY PROFILE

# How Fantasia helped two in a hut grow rich and famous

"From log cabin to White House" describes the careers of Silicon Valley folk heroes Bill Hewlett and Dave Packard. In their case, from *wooden garage to $4.2 billion multi-national company* (writes John Riley). The story began in Palo Alto, California; and in 1938 the first break was an order from Walt Disney for eight oscillators. By 1943 sales were $1 million.

SINCE the humble beginnings in 1938, Hewlett-Packard's expansion has continued steadily, always on the principle that it was financed from within, to make Hewlett-Packard the world's largest manufacturer of test and measurement instruments and a leading small computer manufacturer with plants in Europe and the Far East as well as the US.

While Packard, as chairman of the board, and Hewlett, as chairman of the executive committee of the company, still retain much influence they are now on semi-retirement. It is John Young as president and chief executive officer who has for five years been holding the reins. After a slow transition, he has recently been pulling the computer side of the company away from its traditional trajectory.

A keynote of Hewlett-Packard's success, and paradoxically a cause of its headaches today, has been its partition into 44 separate product divisions to maintain the entrepreneurial spirit and to allow the company to respond quickly and effectively to market changes.

That approach has worked well with the traditional side of Hewlett-Packard's business, electronic test and measurement products which accounted for 37% of sales in 1982; medical electronic equipment (8%) and analytical instrumentation (4%), where the products are independent of each other and where competitors are often small businesses.

In addition, with the electronics products being independent of each other, the company has been primarily product oriented – that is, the engineers produce their products and then seek a market for them, rather than allow themselves to be driven by the market.

However, the company's move into computers in 1966 placed it in a different ball game, which it is only this year fully beginning to adapt to. The proliferation of independent divisions within the company and the emphasis on products over marketing led to problems in the 22 data processing divisions. Various divisions were making overlapping machines, and, far worse, they were, and some are still, incompatible.

Peripherals from one division were not always compatible with CPUs from another, the technical computers are not able to interact with the commercial computers, and inside the commercial sector, minicomputers such as the 3000 Series and the 250 Series cannot yet communicate with each other.

In addition, the inability to have 32-bit addressing on the MPE operating system aroused fears that the highly successful 3000 Series was falling behind the full 32-bit superminis produced by rival companies. The company was also late into the personal business computer market.

Moreover, Hewlett-Packard has had a mixture of concern and pride in being a breeding ground for successful start-ups – James Treybig, a former marketing manager, founded the failsafe computer company Tandem in 1974, and former engineer Stephen Wozniak set up Apple Computer in 1977.

The company does not want to go the way of Fairchild Camera and Instrument Corporation, which lost most of its top engineers to the semiconductor giants in the late 1960s.

Despite these problems, the Hewlett-Packard computer divisions have expanded more rapidly than the others in the company and in 1982 DP products comprised $2.2 billion, or 51% of the total company sales.

That figure places it seventh worldwide in the computer business, with IBM ($31.5 billion) in the lead and Digital Equipment ($4.0 billion) in second place.

Hewlett-Packard claims the gap is still smaller if one looks at the small computer systems businesses in those companies – it puts IBM at $8.8 billion and DEC at $3.2 billion.

With rapid growth making the DP part of the business the main revenue earner for the future, but

**The company's move into computers in 1966 placed it in a different ball game, which it is only this year fully beginning to adapt to**

with several minicomputer companies reporting slippages in their revenue growth, it became apparent to Young that change was necessary, to close the gap with IBM as well as securing the longer term growth path.

The problem Young faced was how to keep the balance between informality and rationalisation. "Becoming a computer company has had a dramatic effect on our company," Young said earlier this year. "Our problem now is how to keep the best of our small-division, entrepreneurial system, find a strategic glue that can get the divisions working as a team, and rationalise to one computer architecture."

The solution, announced in February this year, was to shake up the organisation of the DP related side of the company by amalgamating the 22 data processing divisions into five main groups, while maintaining the policy of accessible and informal management by walking around".

The change, which is organisational and not physical, is scheduled to be complete by November 1 this year, and marks the transition of the DP products side of Hewlett-Packard from a product-driven to a market-driven organisation.

Each of the five new groups is managed by a vice-president and combines the technical and the commercial areas. The groups are:

- The Information Products Group under Dick Hackborn, which will be responsible for linking networking, data communications and peripherals. This group will liaise closely with:
- The Computer Products Group under Doug Chance which is now responsible for both commercial and technical CPUs as well as producing integrated computer aided engineering software solutions.
- The Personal Computer Group under Cyril Yansouni welds together the two personal computer divisions, and it is pulling out all stops to launch a business personal computer this autumn.
- The Computer Marketing Group under Jim Arthur is now co-ordinating field sales, as well as systems and customer engineering.

The Business Development Group is a new creation which will under Ed McCracken, identify markets, set up systems marketing centres and be responsible for interactive marketing communications. It is this group that John Golding, business development group manager for the UK, thinks "is the missing element in a cohesive marketing approach that will let us roll from number seven to number three".

Roger Cooper, Hewlett-Packard's European sales manager, aims to beat IBM at its own game with the aid of the Business Development Group: "In the past we have had the products, but IBM has had a superior selling, marketing and support organisation. We have realised that we must produce the solutions that the customers want."

The tighter organisation reflects a tighter strategy for the future. With hardware prices falling rapidly and software costs rising, the company is investing more heavily in software development, both applications as well as systems software.

The framework for the new strategy is called the manufacturer's productivity network, which focusses on helping manufacturers link their computer applications and resources.

It concentrates in four areas, matching the main manufacturing operating functions: computer aided engineering; factory and plant automation; administrative and office services; and operational planning and control systems.

"We understand manufacturers because we are a manufacturer," said Roy Hardcastle, the UK sales development centre manager, "and our aim is to provide solutions in those areas. We aim to concentrate on what we're good at and our strength is networked interactive database systems."

The company readily acknowledges its past mistakes: "In the past we were arrogant towards third parties," said Cooper, "but now we recognise that there is an essential need for a third party channel and that they have vital resources. We are now talking more in terms of what we can do for them."

The company's emphasis on standard solutions rather than customised solutions means that it will work closely with software houses who will provide the customised solutions. It also aims at encouraging OEM deals.

Cooper is looking towards DEC OEMs in particular, "especially the big ones doing high volume business. The way to talk to major DEC OEMs is to talk about areas of business where they have to change in the future, such as applications generators, Unix and so on, where they have to look towards new technology tools."

Although the company admits it was slow to jump on the business personal computer bandwagon, it is confident that it can catch up lost ground. "We missed the boat with personal computers," said Jef Graham, European manager for major accounts and third party sales.

"We missed a few dollars early on – most of us caught a cold and it wasn't a case of standing back and watching the stampede. But the market is developing a strategy and there is still a lot of room for a strong vendor to drive that strategy. IBM isn't doing that."

Hardcastle gives another example of how the lack of a Business Development Group equivalent affected Hewlett-Packard: "We didn't do the market research on the IBM System 34 and missed out on opportunities there. The sales people didn't realise how small it was and we put up too large a system against it. We should have put the HP 250 against it, not the HP 3000."

But Hardcastle is confident for the future. "We have re-educated ourselves," he asserts.

However, one thing that the company does not want to do is throw the baby out with the bathwater. It does not want to lose the informality that Young last year called "the foundation of our whole strategy for success".

The informality aims at spreading effective communication both up and down throughout the company and the two key policies to achieve this are "management by wandering around" – where managers go on the beat regularly, and the "open door policy" which employees can invoke to see superior managers about grievances.

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The offices are open plan and senior staff are not partitioned off from junior staff. "A good illustration of the relaxed atmosphere comes across in Germany," said Graham. "While staff in a neighbouring company address each other using the formal 'sie' and 'Herr', at Hewlett-Packard we use the familiar 'du'."

*HEWLETT (left) and PACKARD . . . Their garage workshop grew into a $4.2 billion multi-national company.*

*The hut where it all began.*

■ Continued from page 12

But the company still needs new products. "New products are the lifeblood of our business," said Young. "At Hewlett-Packard, fifty 70% of our 1981 order volume came from products introduced in the last four years. It's essential that all of us in this business remain continually alert to technological advances which offer potential for new or enhanced products."

The company is uneasy talking about future products, sharing a concern common with other manufacturers that users of existing equipment will unnecessarily hold it down. But Graham is anxious to reassure them: "A new product doesn't mean that the old one is finished," he explained. "With us they are complementary. New doesn't imply successive."

The top priority is the personal computer, which is under test at the company's Grenoble plant. This will be an intelligent successor to the 120, 125 series of commercial micros and will act as an intelligent terminal to the HP 3000 Series of commercial minicomputers.

"Personal computer companies have to develop multi-terminal systems," said Graham. A small 3000 minicomputer is expected to be announced alongside the personal computer, which will also integrate IBM PCs and allow them to be connected to shared resources. The company hopes that 20% of its revenues by 1985 will come from personal computers.

Hewlett-Packard also plans to introduce a new 32-bit machine which is completely MPE compatible but which also runs Unix and a new operating system HPE (Hewlett-Packard Executive). The new machine will be top of the 3000 range and is likely to be released in mid-1984.

The recently upgraded MPE, MPE V, is a "step towards this", said Graham. In the longer term the technical operating system RTE – which was recently upgraded too – and other operating systems will be available on the 32-bit 3000. The 3000 will be compatible with the 32-bit 9000 technical computer which went into volume production this year.

"DEC is trying to get one operating system with universal capability," claimed Graham, "but we're trying to get universal hardware capability and then change the operating system to suit the user."

In the meantime a Business Basic Compiler is being developed to link the two commercial minicomputer series, the 250 and the 3000 Series, by the end of the year, and the 32-bit 9000 Series will eventually be linked to other technical 9000s. The software from the technical micro, the 200 Series, will eventually be transportable to the 9000 Series through Unix.

Hewlett-Packard is steadily increasing its software development, concentrating on standard solutions within vertical markets. "We are committed to providing applications programmers with application production tools for the 3000 series," said Hardcastle, "and our applications packages allow user exits, so that when modifying our standard packages they can write their own software in without disturbing the source code."

Software development in Germany focuses on computer-aided engineering packages, and mechanical engineering software solutions, whereas in the US emphasis is placed on electrical engineering packages. In the UK, at Hewlett-Packard's Pinewood base office, productivity software is developed, while at the company's French plant at Grenoble much attention is being paid to connectivity between the technical 1000 Series and personal computers, and to linking various types of programmable controllers.

Cooper confirmed that there is activity on the PABX front: "We are currently certifying certain PABXs – we are talking to Plessey in the UK, to Rolm in the US and to Northern Telecom."

**One thing the company does not want to do is throw the baby out with the bath water. It does not want to lose its informality**

Looking into the more distant future, Hewlett-Packard's R & D laboratories are working on future generations under Joe Birnbaum, ex-head of IBM's R & D and now head of Hewlett-Packard Lab's computer section. "The old idea of an operating system is the bigger the better," said Graham, "but now they reckon the smaller the better and bolt on the bits you need. The labs have by-passed optical fibre technology and use infra-red interfaces."

There are several manufacturing plants in Europe, each concentrating on different products. The new Bristol plant, which has started to produce advanced disc memory devices is expected to employ over 1,300 people by 1985.

The technical Series 1000 and Series 100 and 120 computers are manufactured at Grenoble and the commercial series 250 and 3000 minicomputers, together with the technical 9000 series 32-bit machine, are manufactured at Boeblingen, in South-west Germany.

"To attract the best qualified people, we build our facilities in desirable locations, often near university campuses where our people can continue their education," said Young, explaining the choice of locations.

Hewlett-Packard has teamed up with the Japanese company Yokogawa to make the technical 200 and 1000 Series for the Japanese market. Terminals are manufactured in Taiwan and a plant is scheduled to open soon in Mexico.

In all of its manufacturing plants the company uses its own equipment wherever possible, from electronic test equipment to business systems and software for a range of administrative services. "An important part of our manufacturing strategy is that the quality control manager is a key person who reports directly to the general manager and not to the manufacturing manager," said Graham.

Hewlett-Packard's manufacturing plant at Boeblingen illustrated the company's production philosophy. It is in the heart of an industrial area south of the university town of Stuttgart and employs 110 people to make the commercial HP 3000 and HP 250 minicomputers as well as the technical 9000 Series. The striking feature of the factory is its quietness – it is quieter than an average office.

The plant produces around 115-130 HP 3000s and about 150 HP 250 machines each month and every effort is made to cut down overheads and increase efficiency. "We buy the cabinets from outside vendors – so instead of making cuckoo clocks, the craftsmen of the Black Forest are now making computer cabinets," said Hartmut Halverscheid, production manager for the 3000 and 250 production lines.

The integrated circuits are put into the boards automatically with an Amistar CI-1800 automatic loading system, which takes three seconds for each insertion, but the capacitors and resistors are loaded by hand using an actual board as a template.

The minicomputer boards are tested on the HP 3060 board test system which tests components, shorts and opens, and for function. For the 9000 series it picks up etching, soldering and components failures.

"We test 3.9 million components a year and save £20,000 a year by using automatic test equipment," said Halverscheid. "This year we are 20% down on component failure detected by our customers outside and 40% up on failures detected in-house, because we are catching them earlier."

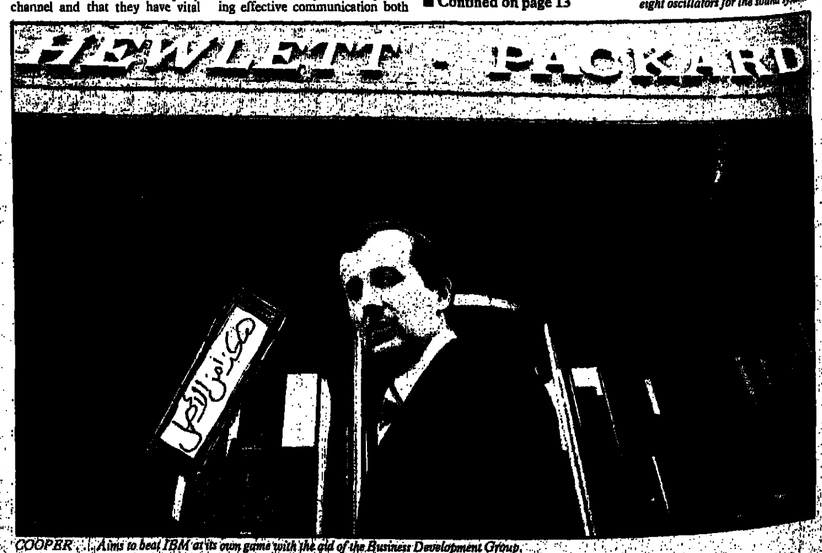
Halverscheid aims to get productivity up next year by cutting down on cable – "cable trees are the old technology" – and over the next few years plans to extend automation to loading capacitors on to personal computer boards.

Halverscheid's aim is to keep machine growth rate above that of the direct labour force. "At present we have a yearly growth rate of 25% for the machines and about 12% for the direct labour force."

The shop floor, where the machines are produced, is on a separate wing of the sales, marketing and administrative building and integrates effectively with the rest of the building, even sharing the same computerised canteen.

*Disney's Fantasia was Hewlett and Packard's first break. They provided eight oscillators for the sound system.*

■ Continued on page 13




*COOPER . . . Aims to beat IBM at its own game with the aid of the Business Development Group.*

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HEWLETT PACKARD

**COMPANY PROFILE**

**Squeezing the power of a mainframe computer on to a silicon chip must have seemed as absurd an idea as getting four elephants into a mini when Dave Packard and William Hewlett set up their company. It was, however, to become the largest electronic instrument manufacturer and a major force in the computing industry. Sarah Underwood looks at the success story.**

# Empires can grow from absurd ideas

*HEWLETT and PACKARD . . . Nearly 50 years ago they can't even have dreamt of the concept of packing so much computing power into a small box.*

TRADITIONALLY known as a manufacturer of test and measurement instruments rather than as a systems manufacturer in its early years, Hewlett-Packard has recorded an impressive growth in computer sales over the past decade. Computer sales out-stripped those of instruments for the first time last year.

The mainstay of HP's computer product range is its line of minicomputers which, according to US market research group Dataquest, won the company a 19% share of the $8.24 billion minicomputer market last year. It also brought it in second after leading mini manufacturer Digital Equipment (DEC), which sweeps the board every year and in 1982 picked up 42% of the market.

Success with its minis in the industrial market has always been fairly certain for HP's Computer Products Division. It is in the fields of business systems and personal computers that HP is having more trouble in its attempt to break new ground and move on to wider commercial success.

Dataquest gives the company an 8% share of 1982's $5.88 billion worldwide market for medium-sized business computers, down from a 10% share in 1980. In the personal computer market it is estimated to have lost 2% of its 1980 share to come in with a 7% slice of the $2.25 billion market last year.

The company's total worldwide sales last year reached $4.2 billion, with sales from the Computer Products Division accounting for 51% of the figure at $2.2 billion. Total earnings were $383 million, about 25% up on 1981's comparable figure and a notable achievement in times of cut-throat competition and a poor economy.

Although, like most of its competitors, HP is a US company doing things the American way, its presence in the international market has always been strong. Last year saw orders for the whole company of $1.96 billion from international customers.

In Europe, the UK and West Germany are its major markets accounting for 13% of European orders each, while France places 12% and Italy 6%.

In the UK, the computer group contributed 56% of total sales, which stood at £168 million last year. But it is the international markets which are giving chief executive officer John Young a few headaches this year.

**Although HP is a US company doing things the American way, its presence in the international market has always been strong**

Revenues and profits for the corporation as a whole have continued to increase until now, and look like doing so for the remainder of HP's financial year which ends in October, but it won't be thanks to any increases in overseas trade.

When reporting a 13% increase in sales and a 16% rise in earnings for the second quarter of this year, coupled with computer orders up 15% over last year's comparable period, Young noted that international orders were sluggish.

He said that US orders were pulling away from European ones and that there was little improvement in any major markets outside the US, with Europe being especially weak and showing flat order levels against a year ago.

HP's answer to flat order books has been to put more money in the field for things such as training and customer service to backup a product line which, if customers are not scared off by the illogical numbering of systems, should strengthen its position among the world's leading computer vendors.

At the top of HP's computer range are the elephants in the mini — or the HP 9000, a 32-bit computer which can be packaged in a desk-top unit. Below this are two 16-bit minicomputer lines, one designed for industrial automation markets and the other for the commercial sector.

At the bottom of the range is a wide variety of personal computation products spanning from small hand-held calculators to desk-top technical micros.

The HP 9000 fits into the company's overall strategy for computation, the manufacturer's productivity network (MPN), which aims to provide solutions in computer aided engineering, factory automation, operational planning and control plus administrative and office services.

Designed for the computer aided engineering (CAE) market, the 9000 was HP's first 32-bit computer family when it made its debut in November last year. Built around the company's proprietary Focus 32-bit chip set, which is claimed to include some of the densest semiconductors on the market, the system can accommodate from one to three CPUs and be packaged in either a desk-top unit, a rack-mountable box or a minicabinet, which forms the hub of single or multi-user configurations.

With a performance rating of 0.7 million instructions per second (mips) the 9000 operates under two environments, Pro Basic and HP-UX, the company's extended function version of the Unix operating system. This adds virtual memory for both programs and data, and Image/9000 database-management software. HP-UX also supports Pascal, Fortran and C compilers, plus Ethernet local area networking.

The desk-top workstation version of the 9000 includes either a monochromatic or colour graphics display, whereas the other two systems are purchased without screens.

An integrated workstation with a single CPU, one Mbyte of RAM, a 270 Kbyte floppy disc, 10 Mbyte Winchester disc, thermal printer, single-user Basic and HP-UX operating systems, plus Fortran and Pascal compilers, HP graphics library and a monochrome display, comes in at around the £35,000 price mark.

Variations on the theme are endless, with a bare minimum OEM box with single CPU and RAM costing around £16,000. But, as needs grow, customers can link peripherals to the system such as printers, 3½ or 5¼-inch floppy disc drive and Winchesters to a maximum storage capacity of 400 Mbytes to the system.

Since volume shipments of the desk-top 9000s started earlier this year, software available for the system has continued to increase, coming not only from HP, but also from OEMs and third party suppliers.

Mathew Wallis, UK third party programme co-ordinator, said: "The 9000 means that each scientist or engineer can have his own mainframe in a micro package on the desk. It excels in number crunching, so it finds applications in tasks such as electrical design and software productivity."

Besides facing competition from DEC's Vax series of 32-bit computers, the 9000 also competes with systems from companies dedicated to the CAE market, such as Computervision and Applicon. Although it is too early to put a number on the systems installed base it is already considered by some to be the ultimate in desk-top computing.

Falling into the industrial automation quadrant of HP's manufacturer's productivity network is the HP 1000, a 16-bit minicomputer family which first appeared in 1968 and now claims a worldwide user base running into tens of thousands.

The oldest 1000 lines still available are the E and F Series. The E-Series offers a memory capacity from 64 Kbytes to two Mbytes with mass storage devices adding up to 960 Mbytes; while the F-Series adds a floating point processor, scientific instruction set, a fast Fortran processor and double integer calculations and polynomial evaluation, giving it powerful computational capabilities.

Like the E-Series, the company's 1000 A-Series introduced early last year is available in boards, boxes and fully configured systems. Designed for the OEM and industrial automation markets, the series includes three models ranging in performance from one to three mips.

All three models use HP's RTE-A operating system, making software transportable across the range. RTE-A is a real-time, multi-user, multi-programming system that allows the 1000 system to support up to 128 Mbytes of data storage, mass storage up to 20 gigabytes, and to run high level languages, including Fortran 77, Pascal, Macro and Basic.

Manufactured in Grenoble, (France) the A600, A700 and A900 can all support a wide range of Winchester disc storage devices as well as HP peripherals, including standard and hermetically sealed industrial terminals, wands, card-readers, bar code readers, time-in-attendance terminals, printers, plotters and instruments sold by the company's other division for things such as laboratory automation.

A data communications interface allows the 100 to communicate with other HP systems, as well as across public networks through an X.25 connection and to systems manufactured by other leading vendors.

A software interface linking Allen-Bradley, Siemens and Telemecanique programmable controllers to the 1000 A-Series is also available. Other special software designed for the 1000 is HP's quality decision management package, which provides statistical quality control throughout the manufacturing process.

HP's latest enhancement to the A-Series is a compact microsystem packaging which brings the original wardrobe-sized systems down to a more manageable desk-top size. Introduced this summer, the micro 26, 27 and 29 models which make up the new family have a 16-slot card cage that can house a choice of the 1000 A-Series of one and three mip computers.

In addition, control store, I/O cards, measurement and control cards, plus battery back-up cards can also be slotted into the units, along with an optional 10 Mbyte Winchester disc and a 270 Kbyte microfloppy.

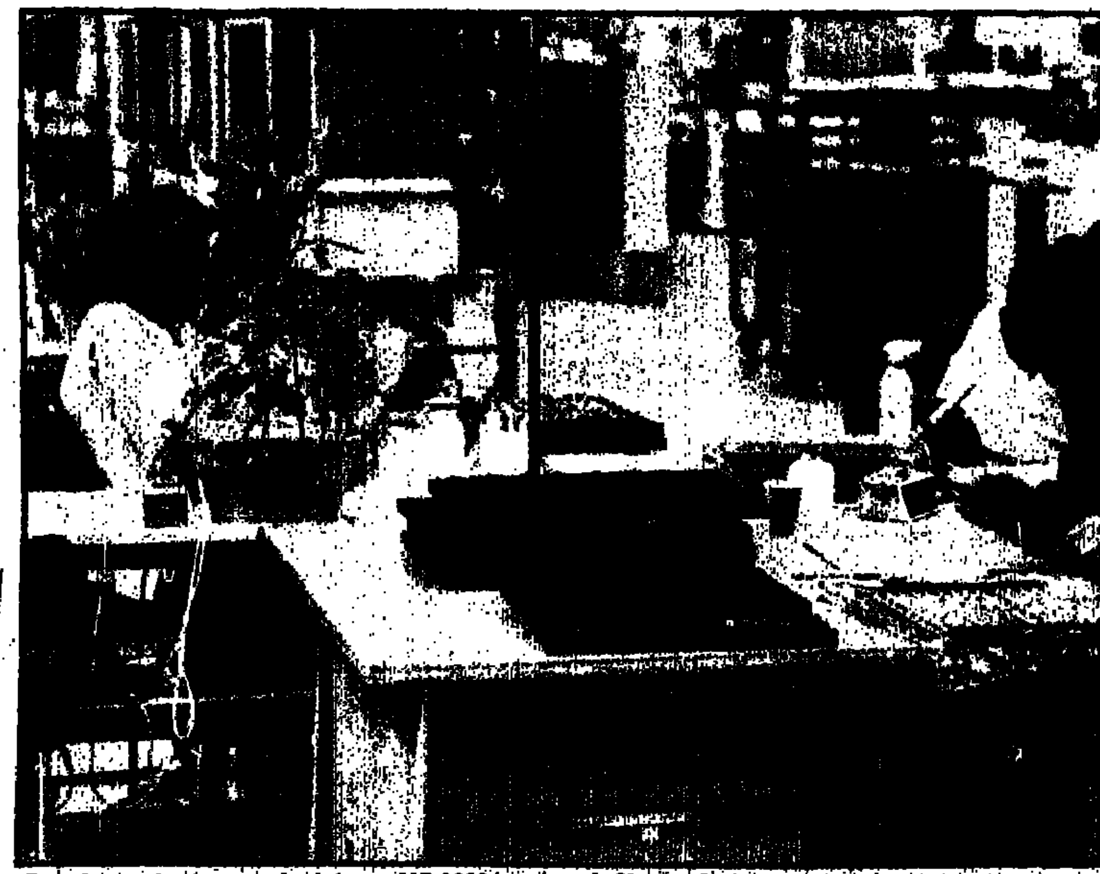
Priced from £10,000 to over £20,000 including integrated peripherals, first shipments of the micro systems are scheduled for September.

Mike Fish, marketing engineer on the 1000 family, commented: "The main uses of these systems are in industrial and laboratory automation. What differentiates them from the 3000 family of commercial systems is their real-time operating systems.

"Like all the minicomputers they compete with DEC machines, but also with systems from specialist manufacturers such as Gould and Perkin-Elmer."

On a par with the 1000 family of industrial automation systems is the HP 3000 commercial computer range. There are four series in the

■Continued on Page 15



*Capacitors and resistors are loaded on to HP 3000 boards at the Hewlett-Packard factory in Boeblingen, Germany.*



**COMPANY PROFILE**

# Unlikely ideas can lead to success

■ Continued from Page 14

range, the 39, 42, 48 and 68 Series, all built around a proprietary emitter coupled logic 16-bit processor with a 32-bit arithmetic processing capability.

Modular memory units mean that the systems can have as little as ½ Mbyte of RAM on the smallest Series 39, a recently introduced entry-level system, up to eight Mbytes on the largest Series 68.

Winchester disc storage ranges from 28 Mbytes up to a massive 404 Mbytes with system backup provided on either tape cartridge or floppy disc devices, and the ability to add up to 24 disc drive systems to a Series 68 system giving total capacity of 9.6 gigabytes.

Roy Hardcastle, manager of HP's UK sales development centre, said: "The most significant thing about the 3000 family — and something no-one else has achieved — is that one operating system is common across the whole family, so software can be transferred without the need for re-coding or re-compilation.

"Our main competitor is IBM, but DEC, ICL, Honeywell and Sperry are also there, but none of them have complete operating system compatibility."

The operating system available on the 3000 is MPE, recently upgraded to the fifth release. It processes multiple online and batch jobs simultaneously and offers Cobol, Fortran, RPG, Basic, Pascal and SPL/3000 programming languages.

MPE-V can support up to 400 terminals on Series 68 and 24 intelligent network processors for data communications, while on the Series 42 it will handle 92 terminals plus three intelligent network processors.

**"In the technical market we are better known than other vendors — after all, it is HP's traditional market"**

The Series 68, 48 and 42 also feature disc caching, which increases throughput and speeds up response times by saving trips to transfer information needed from disc to main memory.

Prices range from £28,600 for a Series 39 with 512 Kbytes of memory, four terminal ports and a 28 Mbyte disc, up to £178,000 for a top of the range Series 68 with three Mbytes of memory, 12 terminal ports and a 404 Mbyte disc.

Data communications are an important feature of this range. Provided through HP's Distributed Systems Network, communications can be made from workstation to HP computer, from HP computer to HP computer, and from HP computer to IBM mainframe through a set of IBM emulation packages.

Besides linking to local devices, the 3000s can also communicate to remote networks using industry standard interfaces such as X.25.

Software developed by HP includes a suite of office automation packages, program development tools, business graphics software, financial accounting, manufacturing and distribution systems.

Designed for the office market, HP's graphics software can be merged with wordprocessed text, making ideal output for printing on the company's laser printer.

With the 12,000th 3000 system installed at Shell's UK premises earlier this year, Hardcastle is now pushing the computers into new markets.

"Traditionally blue chip companies have been our major customers — large industrial concerns and the manufacturing industries," he said.

"Now we are becoming more market-oriented, driving forward to include solutions for other sectors, such as banking and insurance."

While HP fills the requirements of businesses for distributed systems capable of a wide range of communications functions with the 3000 family, it also offers solutions for personal computing.

Discounting calculators, at the bottom of the range is the Series 40 of hand-held computers, followed by the Series 70 portable computers. These are battery powered, with integral memory and can be programmed in Basic.

The company's desk-top computers start with the Series 80 personal computers. Built around proprietary eight-bit chips, the series has three members all running an HP operating system, although the larger models can also handle CP/M.

The 85B is an integrated system with a thermal printer, 32 Kbytes of RAM and two mass storage systems — tape drive for permanent storage and electronic disc for high-speed performance. The system has a five-inch screen and costs around £2,000.

One up from the 85B are the 86A and B, offering a maximum 640 Kbytes of RAM, plus an option on C/M. These systems are not integrated and cost around £1,200 before a nine or 12-inch screen, floppy and Winchester discs plus printer are added.

The HP 87XM has a similar memory capacity but also a built-in 10-inch screen, and interfaces for 14 peripherals or instruments.

Andy Palmer, in charge of marketing HP's personal computers, said: "The 85 and 87 dominate the technical and scientific management markets, while the 86 is aimed at the business market.

"In that market we face vendors such as IBM, Apple, Sirius and so on, but in the technical market we are better known than them — after all, it is HP's traditional market."

*PALMER . . . "Personal computing is quite a focal point at HP — it is seen as one of our futures."*

*FISH . . . "The main uses of the 1000 systems are in industrial and laboratory automation."*

The Series 80 offers a wide range of core software solutions such as database management, wordprocessing and graphics and can be used as a terminal to HP computer systems.

Specifically designed for the office are the two models which make up the Series 100. The 125 uses two Z80 eight-bit processors and has built-in CP/M making a wide range of software including Visicalc, graphics, wordprocessing and Basic packages available.

The system has 64 Kbytes of memory and can handle from 248 Kbytes of data on a floppy disc drive up to 4.6 Mbytes on a Winchester device.

The 125 started life as a terminal so while it has no networking facilities it has excellent protocols enabling it to communicate with the HP 3000 commercial system.

Palmer commented: "The 125 is very popular with our 3000 customers who want local intelligence and processing power, as well as communications to an HP minicomputer.

Without disc drives, a 125 with keyboard, systems box and 12-inch screen costs just over £2,000, while the 120 costs just under that.

HP's most powerful personal computer family is the Series 200 technical system. All three models in the series are based on Motorola's 16-bit 68000 processor with 32-bit internal architecture.

The Model 16, priced at £3,800 with 512 Kbytes of RAM, is packaged in the Shadow terminal. It uses a proprietary HP operating system and offers Basic and Pascal programming languages.

More expensive, but with built-in discs, is the £8,000 Model 26 which, with its small screen, is often used as a controller. A non-colour, top-of-the-range Model 36 with built-in floppy disc drive comes in at nearer £8,400, while a colour version providing good graphics facilities costs around £10,500.

Palmer, like his colleagues, pointed out that while HP dominates the technical sector in the personal computer market, it is time that it became recognised in wider applications markets.

He said: "We did over $500 million worth of business in personal computation products last year and will do more this year. Personal computing is quite a focal point at HP — it is seen as one of our futures."

Certainly the pressure is on to pack as much computing power into as small a box as possible in the '80s, but it can't have been a concept that Hewlett and Packard ever dreamt of when they set up shop nearly 50 years ago.

Whether HP will make the grade remains to be seen. But, if it does, the scales will be weighted very much in favour of the computer products division, and the business Messrs H and P got off the ground will take on a new identity.

*HP 250 minicomputers are assembled in Germany.*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COMPANY PROFILE

HEWLETT PACKARD

Hewlett Packard produces everything from mainframes to micros – and the applications the products are used for are just as varied as the ranges themselves. From honey packing to oil exploration, from petrol pump manufacture to sailing – HP computers are there somewhere. Della Bradshaw investigates the far-ranging uses of the company's equipment.

# HP wins through in the sailing season

THIS year's sailing season has particularly benefited from HP hardware. The French, Australian, American and British teams taking part in the America's Cup all had the loan of an HP 120 CP/M-based micro. As the public relations woman put it: "You can either say we're being unbiased, or that we're hedging our bets – whoever wins we get a story out of it!"

The person in charge of the British team's micro is Robin Chapman, legal adviser and administrator for the team. He is incredibly enthusiastic about the HP 120, especially from the point of view of support.

"I know if I get stuck or some strange symbol comes up on the screen," he said, "I can just phone up and there'll be someone there to sort out the problem."

Chapman uses the HP 120 for general business applications, financial worksheets, wordprocessing and stock control via a database. In Newport, Long Island, the finishing point of the race, the speed and direction of winds as well as tidal changes are all worked out on the CP/M micro.

Chapman, however, is more interested in the value of the hardware. "I have to travel a great deal to places like Amsterdam and the US. When I go over to the States I don't need to take the machine with me as HP provides one for me over there. But obviously for Europe I need something portable, and the 120 fits into two cases.

"Before we got the HP we had an Apple and we hired an Osborne. With the Osborne the floppy discs got damaged quite easily in transit. With the small 3½in discs on the HP machine I just throw them in a briefcase and take them out unscathed."

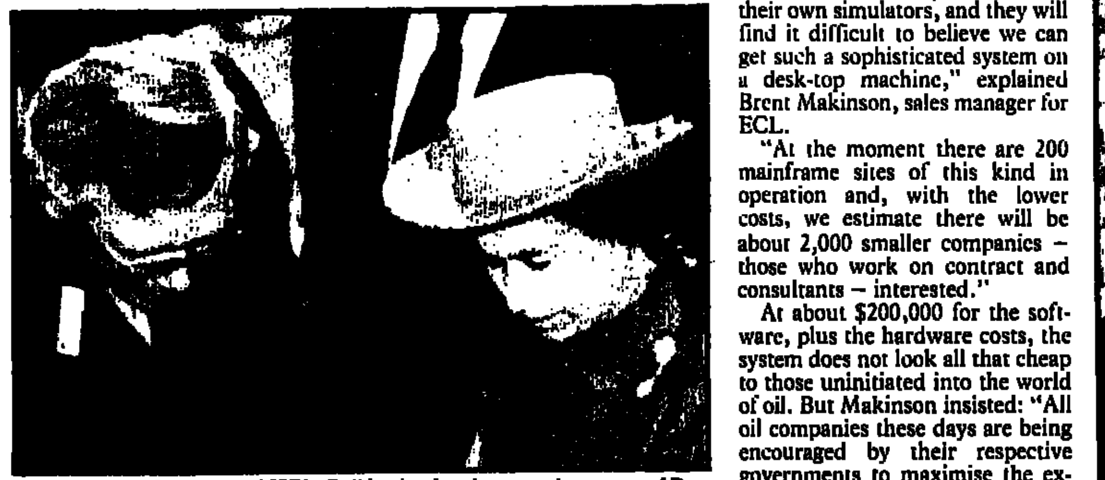
Chapman got the HP 120 in April. "But if we'd got it earlier," he said, "we could have done much more with it."

At about the same time the British crew in the America's Cup obtained another HP micro for a very different purpose – the HP 41 hand-held micro, which the crew use for navigation.

Barry Clark of Hewlett-Packard explained how it all worked: "Astro-navigation depends on the almanac, which is 56 stars and planets, and that is stored in the 41. Each almanac has to be updated every seven to 10 years, depending on the algorithms.

"The crew of the yacht note their time and altitude and then note down two stars to get a point fix. If they can identify three stars, they can get a cocked hat fix."

It all sounds very specialised, but the use of hand-held computers in sailing and other outdoor activities appears to be taking off.



*The Queen is shown round HP's California plant by general manager of Data Systems Division Franz Nawratil. Accounts at Buckingham Palace are worked out on the HP 250.*

The HP 41 has found a niche in racing yachts for use in tactical planning. Nobody wants to spill the beans about how that is done – obviously a case of trade secrets.

In the Victory '83, the British entry in the America's Cup, the micro is being used to test real speed versus apparent speed in the hope that it will rush the British team to victory.

The HP 41 has also been taken on balloon races and has even made it to the top of Everest. And to cap it all, in the recent Space Shuttle mission each of the astronauts carried one of the micros as a back-up in case the main computers decided to opt out.

Data logging is another big use of the HP 41, as the clever little machine can read bar codes. And it can be used as a general micro for things like statistics and financial applications, as well as for circuit analysis for electricians, fluid analysis and aviation.

The HP 250 is no stranger to unusual applications either. Perhaps the most interesting one is the accounts in Buckingham Palace, but as we could not get a lot of information about that one we decided the Rowse Honey company came a close second.

Rowse Honey is the second largest honey packer in the UK, after Gales. Honey packing is quite a complicated business, apparently, as Steve Rowse, managing director of Rowse Honey, pointed out.

"In our business the pricing is very important. There are about 50 different kinds of honey, which come in everything from one pound jars to seven pound buckets, and we sell those to everyone – from health food stores through the big supermarket chains to corner shops.

"Each shop or chain has a different price list – there are about 200 of them in all, and there are about 250 stock items, so you can imagine the sort of figures we have to deal with."

Before getting the HP 250, Rowse Honey depended on a Kalamazoo paper system. In 1979 Rowse bought the 250 with one extra terminal and a 20 Mbyte disc, and the system has remained the same since then, although, as Rowse pointed out, "the system helped us to expand."

"We now have a turnover of £3-4 million," he continued, "and a staff of 50 people, but we still only have one person on the computer."

Rowse wrote most of the software for the system himself in conjunction with the software house Midas. Since then the software has become the basis of several packages available from Midas.

"The whole system was designed to do a job," recalled Rowse. "In the honey business it's not necessary to hold stock, so we didn't need a stock control system, or some of the other basic packages that you can buy. And it's proved that if you can get a system in and working, it can be very successful.

"With the software the whole thing cost about £25,000, and that's nothing really for a damned good installation."

It may seem a far cry from honey to oilfields, but a company called ECL (Exploration Consultants Ltd), in Henley-on Thames, has developed a software package on Hewlett-Packard's 9000 desktop computer to make the transition from honey packing to oil reservoir simulation look like child's play.

The new software designed by ECL will make its debut in San Francisco on October 5 on a Hewlett-Packard machine. Until now, the company has operated on a consultancy basis only, but it is now convinced the move into software sales will be a success.

"Most major oil companies have their own simulators, and they will find it difficult to believe we can get such a sophisticated system on a desk-top machine," explained Brent Makinson, sales manager for ECL.

"At the moment there are 200 mainframe sites of this kind in operation and, with the lower costs, we estimate there will be about 2,000 smaller companies – those who work on contract and consultants – interested."

At about $200,000 for the software, plus the hardware costs, the system does not look all that cheap to those uninitiated into the world of oil. But Makinson insisted: "All oil companies these days are being encouraged by their respective governments to maximise the extraction of oil from their oilfields. And so companies are spending a lot of money on systems to begin with to ensure they utilise the oilfields to the full."

To predict how a natural oil reservoir will deplete and where the oil company should drill to maximise production is more complicated than it might seem to the onlooker.

"The fluid in the rocks can move along the different layers at different speeds," said Makinson.

"Our system also incorporates secondary techniques – for example, the company might want to pump in water round the edge of the bed of rock to maximise the extraction of the oil from the rocks."

ECL's reasons for choosing the HP 9000 for the design of the system were several. Firstly, it wanted to write in a standard language, Fortran 77, so that it could be transferred on to other computers. HP also gave ECL a pre-release version of Unix adapted for the HP 9000.

It was also a question of size and money: "It's a very cheap way of setting up your own reservoir simulation system," concluded Makinson.

Also at the larger end of the HP scale is the 3000 range, various models of which are used in all kinds of applications, including manufacturing. A good example of a company using such a system is Gilbarko, a subsidiary of the Exxon group which specialises in making petrol pumps. The firm has a turnover of £20-25 million and employs over 600 people.

The data processing manager at Gilbarko is Tony Pace, a man with strong views on data processing and on the computer Press. "Why do you people in the media never mention Hewlett-Packard?," he protested. "They really seem to have found a way of making computing simple – you just plug it in and it runs, it doesn't need to be complicated.

"I'm not a computer person myself: I was determined computing was going to be easy, and it was. I'm an angry user – angry *for* HP not against them."

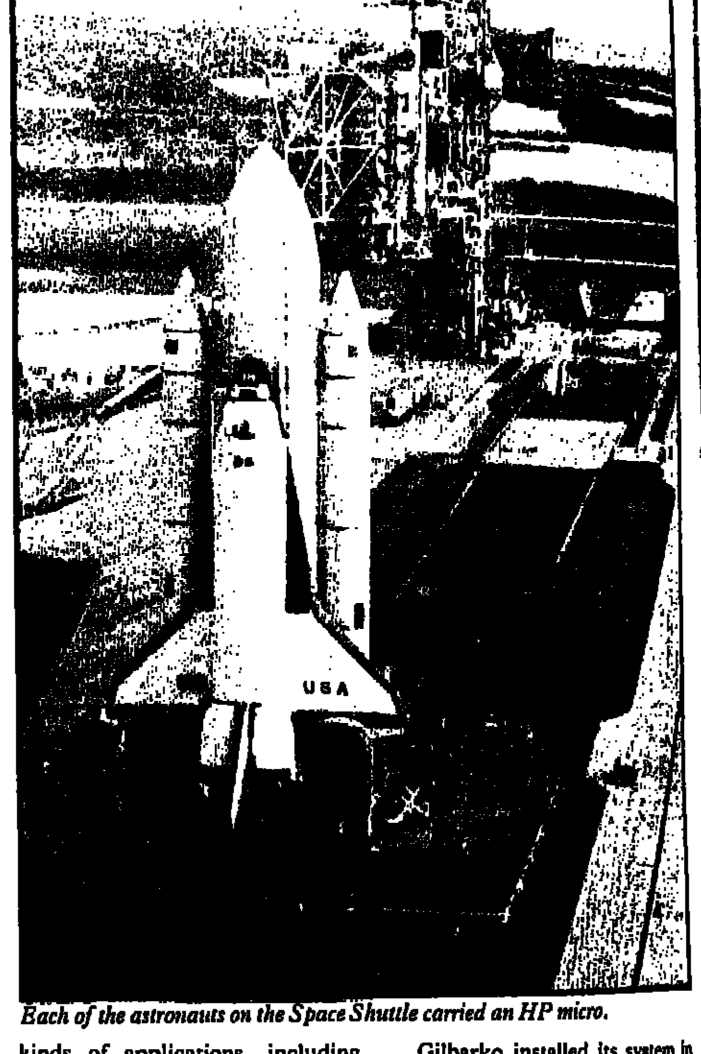
Gilbarko installed its system in 1981 – before that it was on a bureau, which was becoming relatively expensive. Pace opted for an HP 3044 system, with three Mbytes of main memory, a 760 Mbyte disc, two printers, a tape deck and 50 terminals.

The system is dedicated to manufacturing and all the paperwork that involves.

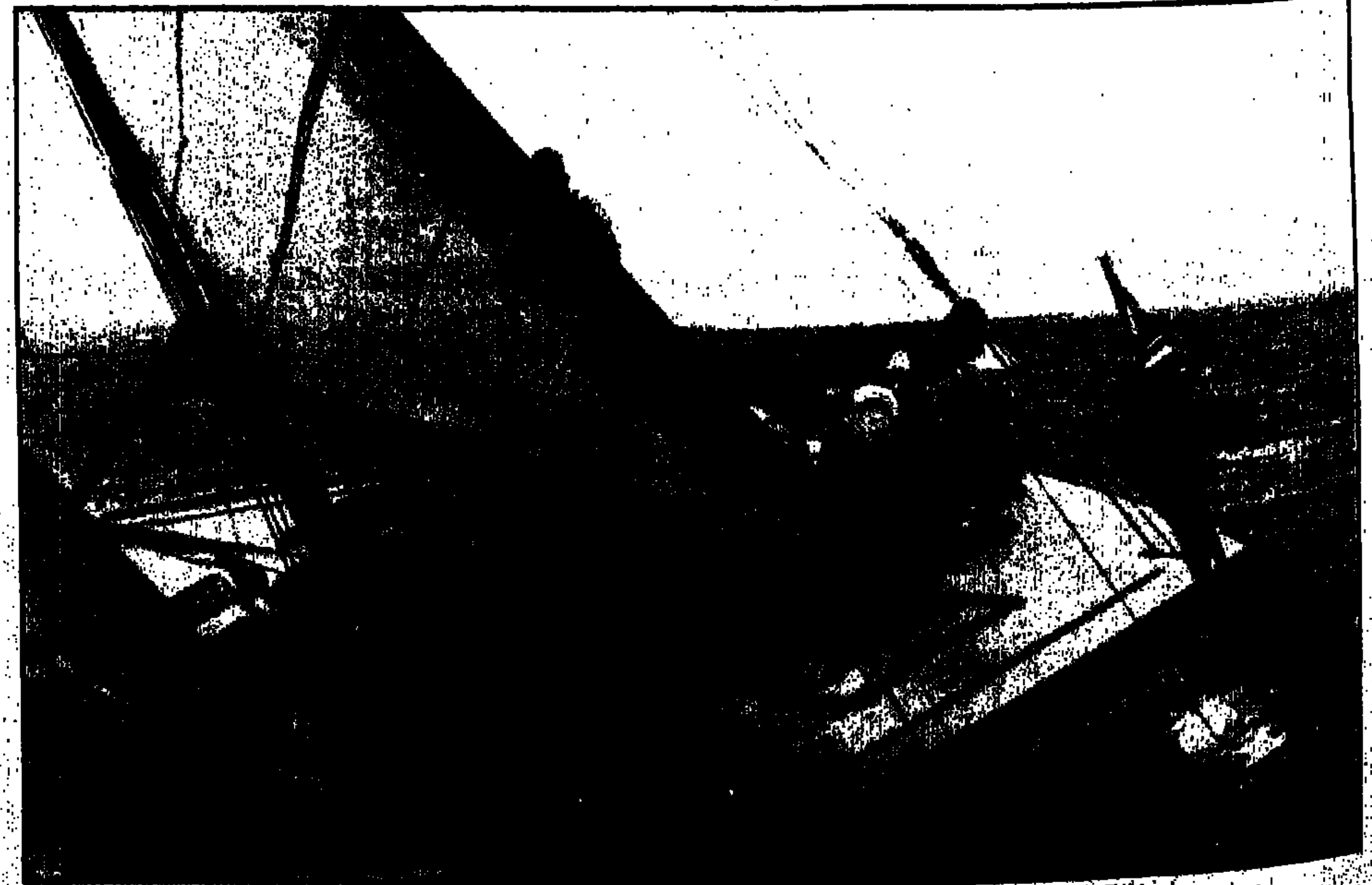
"We wanted a system, not a computer," recalled Pace. "We looked at six companies – Nixdorf, NCR, ICL, IBM, Systime and HP – and the only real challenge to HP was Systime, in terms of price, ease of use and high degree of systems integration.

"Our main line in software is in general packages, in the manufacturing and financial areas, but we wanted packages that worked together – and we've got them."

**"Most major oil companies probably won't believe we get such a sophisticated system on a desk-top machine."**



*Each of the astronauts on the Space Shuttle carried an HP micro.*



*Victory '83 sails off Newport Rhode Island, US, where speed and direction of winds and tidal changes are calculated on the CP/M micro.*



COMPANY PROFILE

# Massive range of hardware inspires software harvest

## Paul Walton attempts to get to grips with the large variety of HP software

THERE is a great deal of software, most of it for technical users, for Hewlett Packard machines. But does it really matter?

People buy HP minicomputers because it "is probably the most reliable, and the best supported in the world", according to Peter Guymer, manager of Systemsolve's HP turnkey and software division. "They don't quibble over cost either," he added.

This has the effect of making the turnkey system building market larger for HP than for, say, Digital Equipment or Data General. But HP's early entry into the technical and engineering market has meant that plenty of those turnkey jobs are now around as packages.

There is a much smaller, but growing, amount of commercial software for the massive range of HP hardware. Guymer thinks that HP has realised quite recently that "if you don't sell all these frills like wordprocessing or office automation, then you might be thought of as a little behind".

It is difficult to cover the entire HP range, as the five major products all have their own peculiarities in both systems and applications software. The major changes taking place have been in commercial software for HP's 3000 series minicomputers.

The 1000, 9000 and 9800 series technical machines are established scientific and engineering workhorses, with a large installed base in the less glamorous field of manufacturing.

Franz Nawratil, head of HP's data systems division, recently outlined some improvements to the manufacturing productivity network (MPN) which runs on the 9XXX family.

He said that a powerful factory local area network (lan) was being developed by HP in collaboration with two of its largest US customers (thought to be Ford and General Motors) to bring real factory automation.

Nawratil outlined the connection of office and factory-based HP machines by means of a more robust version of the Ethernet lan. It is expected to be broadband, and capable of carrying much heavier traffic for less cost and of working in difficult conditions.

HP has two main technical machine ranges: the 1000 series 16-bit minicomputer and 9XXX range, including the monster-seller, the 9800, and the new 32-bit 9000 series. Both come with a great deal of proprietary HP software.

Running on HP's Real Time Executive (RTE) for the 1000 series are process and production control, computer aided design (CAD), and design and manufacturing (CAM) packages. Most can interwork using MPN, and many have direct interface to NC machines tools.

Back in the factory office, the 9800 series is found doing CAD/CAM and more detailed engineering graphics for the draughtsman, using its much larger memory. The recent 9000 series is the first HP 32-bit minicomputer.

HP is collaborating with CAD specialist Pafec to bring all its range of Unix-based applications onto the 9000's HP-UX version of the operating system.

The 3000 series does have applications other than commercial ones; HP sees it as an integral part of the MPN, doing materials or production management, as well as financial accounting with some proprietary packages.

HP now has a separate personal computer division, with three ranges now available, all running CP/M. The baby series 80s are really intelligent technical terminals. Series 100 and 200 rise to more powerful 16-bit Motorola 68000-chip systems, which can also participate in HP lans.

There are almost as many HP lans as there is hardware. Local Resource Manager (LMR), for instance, is simply a shared resource cable that allows Series 200 or 100 to link up to 3000s, or to share peripherals and disc store.

The major HP communications product is its Distributed Systems Network (DSN), a family of hardware and software spanning the 1000, 3000 and the PC machines. It can operate a point-to-point connection, multiple points or clusters. It does X25 links with wide area telecommunications systems, IBM emulation in the 3270 or Batch PJE modes and has its own higher level file and job transfer routines.

Out of the mainstream for a moment, the 250 series is HP's "black sheep" machine. With its own peculiar operating system and range of office packages, this first time machine is intended for third party system sales to the smaller and first time commercial user.

But it is the HP 3000 series that is getting the biggest strategic kick just now into the commercial market. The Multi-programming Executive (MPE) operating system which it runs has just been given a face-lift, with major renovation to follow over the next 18 months.

Jef Graham, HP Europe's sales manager, announced that a second proprietary operating system would be added to MPE, and Unix would also be on offer. The reason for all this excitement is the expected launch of HP's first true 32-bit 3000 machines in mid-'84. All of the company's commercial minicomputers are 16-bit at the moment.

Peter Guymer, who has struggled with the MPE operating system, of which he is not overly fond, pointed out why HP needed to go to 32-bits and a new operating system. Much of HP's operating and systems software is aging, and is based on older concepts now out of fashion.

"MPE is not real-time or virtual," he said, "so that limits your applications. Most of the system tools and concepts that underlie the range have not changed since the 3000 was launched in 1977-78, so it is time to catch up."

The two main system tools for the 3000 – with equivalents on the 1000 sister machine – are HP's Image database and View screen formatter cum Transaction processing (Tp) monitor (though it is not a real-time machine).

Writing real-time programs for the 16-bit machine "strains its I/O so much, that the processor can hardly cope", Guymer said. So HP discouraged use of the present 3000 series for all but simple transaction processing.

The Image database was difficult to use for program development, he added, since the 3000's memory is arranged in 64K stacks, rather than being mapped on to the available internal store. "It is very easy to run out of space if you're writing an application," Guymer said. Enhancements to storage space also don't help.

The view screen formatter was an essential addition for program development. Without its ability to write whole screens of information "in block mode", every application would have to have been built line by agonising line, according to Guymer.

HP has quite recently released its Rapid software development aid, but it is aimed more at the technical than the commercial market. "I want a program generator that can produce Cobol, which Rapid cannot deliver. Data General offer this as standard, and over half the commercial market need it," Guymer said.

The final criticism of HP systems software is that, like many other suppliers, it is written to run as object code, within defined parameters. That made it very hard to maintain, or to develop an application, Guymer added. Fine for production control, but a limitation to commercial packages.

If HP systems software has these limitations, then why do people buy the hardware at all – to use themselves, or to write applications for and sell as systems?

Systemsolve is one of the largest suppliers of commercial packages and turnkey systems. According to Guymer, there were good reasons why an HP system was chosen, and none of them had much to do with the software available.

"A significant number of companies buy HP kit before even considering the software, in some cases before looking in detail at that application."

He added that as well as its reliability being a major factor in this decision, "a lot of the subsidiaries of US corporations actually have a policy to buy HP, whatever".

What this means is that, for commercial applications, three quarters of HP orders are turnkey and very often bespoke systems. There is a small packages market, "for the guy who already has HP kit, has justified its initial cost, and wants to do something else with it", Guymer said.

Systemsolve's experience is by no means unique. Datalogic, Frazer Williams, Silicon and Hoskyns also do a great amount of turnkey work with HP machines. The trend extends beyond the commercial 3000 series to the technical machines as well.

But as turnkey work has been going on longer for the scientific and technical market more packages have been spun off. Systemsolve sells the Electronic Newsroom System (ENS), which it developed for the BBC Breakfast Time show, as a £50,000 package. It is close to first sales of the packaged system in the US.

HP's third party software market is nonetheless healthy, despite the amount of bespoke work being done. Systemsolve is the biggest commercial software supplier here, with Riva the largest technical package dealer.

Riva sells automation software, technical and engineering aids (some on obscure languages), as well as a large selection of vertical market software for retail, distribution and point-of-sale.

Scicon follows Riva with pollution control, maintenance, integrated manufacturing and distribution software.

Systemsolve, Coggon and Frazer Williams are very big suppliers of financial and general business software.

CAP and Hoskyns are involved in production control, integrated manufacturing and technical developments such as Unix. CAP is especially close to HP, working with it on a wide range of systems from military to commercial.

Guymer admitted that Systemsolve did buy in its HP general accounting package, but its first application was to build that into the Booksolve turnkey system it had been contracted to produce.

The difficulty of writing applications must have something to do with this lack of dynamism. HP is already trying to stir up enthusiasm for the 300 series with plans for 32-bit virtual operation with hints that there will also be some goodies coming for the series 80, 100 and 200 microcomputers.

The latest release of MPE, version V, is the most radical change for many years. It has introduced disc caching to release more internal store for development, "which is supposed to increase the throughput by 30%, for some applications", said Guymer.

But the major change must be the release of the 32-bit hardware, and the necessary tools to convert existing applications (largely written in Fortran and Cobol) and ease the development of new ones. Unix will also add new third party packages – HP and CAP are collaborating on this development.

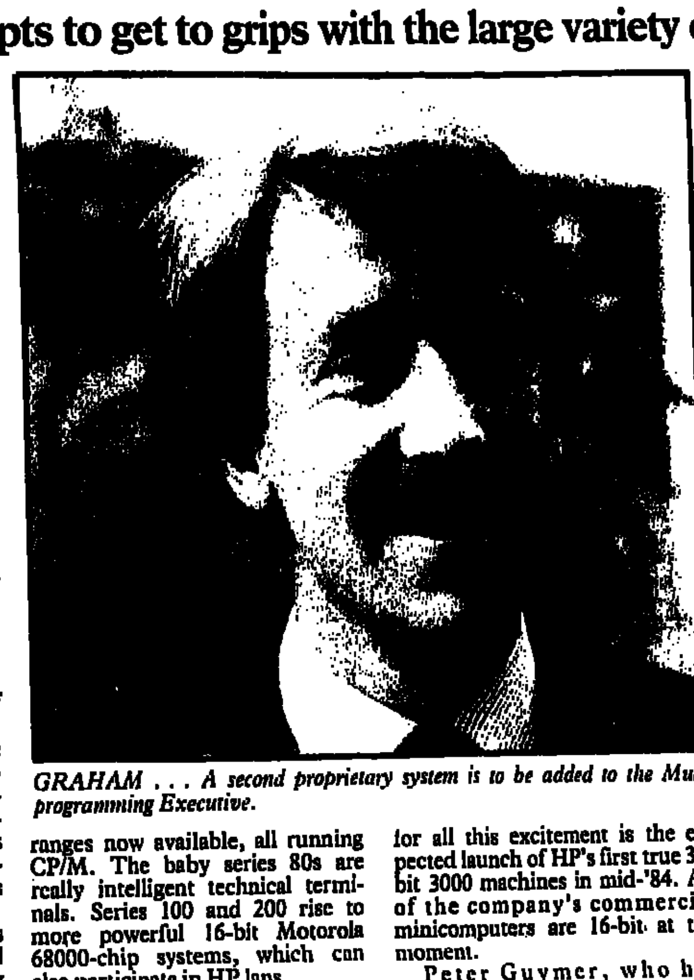
HP has tried to stimulate the development of commercial applications for the 3000 series before, with some international success. The HP Software Guide became a major promoter of packaged software, long before ICL or any other supplier hit on the idea.

The company has not stood still. It has recently stunned systems houses with its first release of major chunks of commercial applications software, like the Interactive Office (IO). But Guymer was less than complimentary about the suite of integrated word/data/graphics packages that go to make up IO. He claimed that these could not compete with 32-bit offerings from Data General and DEC.

One application that HP is traditionally good at is graphics, but again this tends to be limited to very sophisticated pieces of software, which need the 32-bit processing power of the 9XXX technical machines.

Guymer said that HP could sell these expensive systems into the technical market "where it is not cheap, but where it doesn't need to be because it is the best", but not to most commercial users.

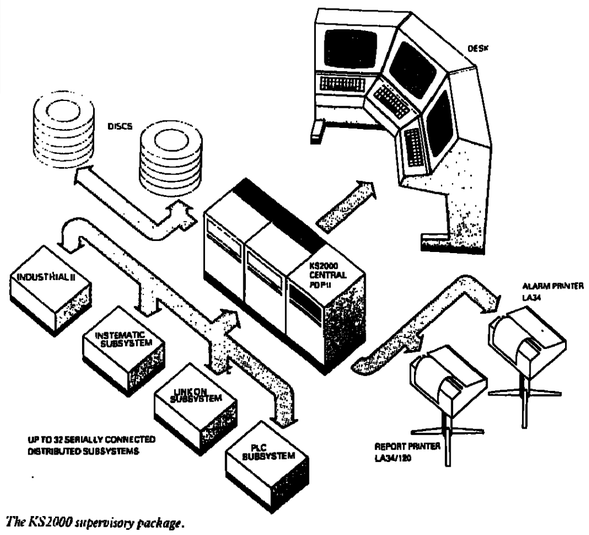
So, the wealth of graphics and sophisticated communications software that HP sells on the 1000 and 9XXX series does not travel well into the office.



*GRAHAM . . . A second proprietary system is to be added to the Multi-programming Executive.*

**The 250 series is HP's "black sheep" machine, with its own peculiar operating system and range of office packages**

*Systemsolve developed the Electronic Newsroom System for the BBC Breakfast Time show, presented by Frank Bough.*




*The KS2000 supervisory package.*

# Centralised monitoring offered by new package

A COMPUTER package providing centralised monitoring and supervision of controllers distributed throughout a plant or factory site is now available from Instem Computer Systems.

The system, called KS2000, is a complete supervisory and monitoring hardware and software package which is claimed to resolve the common conflict between the demands for central monitoring and local control.

With KS2000 the front end controllers or I/O subsystems are distributed as required throughout a site and operate autonomously. During operation data from the front ends is relayed to a central host computer for overall monitoring and co-ordination.

This configuration resolves the problem found in many batching, mixing or blending applications where production security requires front end local autonomy but the centralised supervisory system is essential for achieving optimum plant performance.

With Instem's KS2000 users are able to monitor plant status, log events and alarms, display colour mimic diagrams and print report and alarm data to co-ordinate the plant operation more effectively, say the makers.

The central computer for the KS2000 is based on the DEC PDP/11 range of microcomputers running the RSX-11M disc based operating system.

The choice of system configuration depends on the individual application but will typically range from a PDP-11/24 with three front end subsystems to a PDP-11/44 with 32 front ends, where the I/O for each front end comprises several hundred digital and analogue channels.

The system is capable of communicating with a variety of local or front end subsystems including Instem's own Link-On and Instematic products. However the modular design of KS2000 allows other programmable controllers and data acquisition subsystems to be easily integrated, says Instem.

The database for the KS2000 system is configured to meet each application but the minimum system includes a plant I/O database, with full analogue and digital point specification, including front end subsystem allocation, status and alarm handling.

Command codes on any system keyboard provide online access to alarm limits, scale factors etc. and the database can be modified, printed and displayed as required.

Information from the serially connected front end subsystem is automatically updated on the system database. The KS2000 software organises the flow of data from the centre to the subsystems and vice versa.

**Instem Computer Systems (CW), Walton Industrial Estate, Stone, Staffordshire ST15 0LT. Tel.: (0785) 812131.**

# Range of data capture terminals starts at under £500

MICROFIN Systems' latest range of hand-held data capture terminals starts at under £500 for the basic fixed program terminal. The range provides systems which can be tailored to individual requirements.

The F series has four models with fixed PROM suitable for repetitive data entry in a fixed format. These are targeted at stock control and branch audit. Optional RAM memory sizes from 8 Kbytes are available to suit anticipated volumes. Prices range from £495 to £795, with an optional two-line LCD display at an additional £75.

The P series comprises four programmable models for any data capture applications requiring flexibility, as programs can be down-loaded into the RAM memory when needed. Users can also develop their own programs using the Microfin Development System which runs on any CP/M microcomputer.

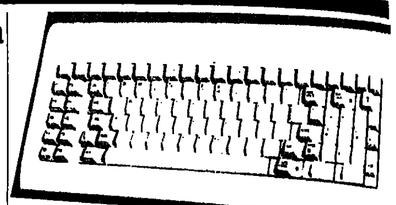
Prices range from £695 to £995 with memory sizes up to 64 Kbytes with an optional two-line LCD display at an additional £75.

The R32 is a version of the Microfin terminal, designed for use with the Microfin Retailer for point-of-sale applications.

**Microfin Systems (CW), Microfin House, Chapel Grove, Addleston, Weybridge, Surrey KT15 1UG.**



*The Microfin P24 programmable data capture terminal.*



*The new keyboard from Key Tronic.*

# 106-key keyboard

LATEST release of a DIN standard business computer keyboard from Key Tronic International features a 106-key sculptured unit in a modern low line case.

The DIN-106 is organised under 8048/8748 microprocessor control and with formatted asynchronous serial output. Interfacing to the system is by RS232C, RS423, RS422, TTL and IBM compatible outputs with a rate selector of 300 to 9600 baud.

Having 21 additional function keys in a single top row, adds considerably to the usefulness of this design for microcomputer users; when also combining N-key rollover, auto repeat and snap on keystations for depopulation, there is an exceptional combination of all the most frequently needed user features, says Key Tronic.

A reliability of 100 million operations MCRF is quoted and the DIN 106 comes either complete in a desk-top console with coiled cable and header or supplied as an OEM keyboard for integration with new video terminal and microcomputer designs.

**Key Tronic International (CW), Electron House, Lenny Close, Hatch End, Pinner, Middx HA5 4SE. Tel.: 01-428 0111.**

# Fast, silent printer from Nixdorf

NIXDORF Computer has launched the Model MDO2 inkjet printer which can be interfaced to all Nixdorf systems. It is a high speed terminal, operating bi-directionally at speeds of up to 210 characters per second.

Its printing noise level of only 55 dB(A) suits it for use in environments such as commercial offices and banks, says Nixdorf.

The MDO2 also offers a typeface with true descenders in lower case. It can therefore be used, for example, for the production of camera-ready originals for price lists, spare parts lists, and equipment maintenance manuals as well as the usual internal documentation, reports and accounts.

The new printer can cope with variable length forms using paper on a reel, or conventional fanfold, edge-perforated stationery. It has a 128 character set with a 13x12 character matrix and indicators for advanced warning of paper and ink shortages.

**Nixdorf Computer (CW), 125-135 Staines Road, Hounslow, Middlesex TW3 3JB. Tel.: 01-570 1888.**

# Colour for Sig/net 2 micro

SHELTON Instruments has introduced a colour graphics facility for its Sig/net 2 microcomputer. It is an optional, extra module which may be included in a Sig/net system at the time of purchase or fitted into a system on the user's premises later.

Sig/net graphics can be in colour or monochrome. Information for a business can be shown by colour bar charts, while process plant control may use graphics for monitoring plant status and it may be used for computer aided design in a scientific application.

It has the high resolution of 512x256 pixels each of three bits. Monochrome provides black, white and six shades of grey; and colour provides red, green, blue, cyan, yellow, magenta, black and white.

For use with either composite video or RGB monitors, the Sig/net graphics facility has non-interlaced scan which enables it to be used with standard, low cost, short-persistence monitors.

**Shelton Instruments (CW), 74/77 White Lion Street, London N1. Tel.: 01-278 6272.**





# Vector Graphic quadruples disc capacity

VECTOR Graphic has introduced the Vector 4/60, a high-performance addition to its 8/16-bit business computer range that offers nearly four times the disc capacity of current systems.

An integrated 5¼-inch, 46 Mbyte Winchester hard disc, with an average access time of 39 milliseconds, makes the Vector 4/60 ideal for applications that require high capacity online storage and rapid access to data, according to Bryan Martyr, Vector's European marketing manager.

For example, the 4/60 can maintain large databases, sorting and selecting greater volumes of information, due to the speed and capacity of the new drive. The Vector 4/60 also has a 5¼-inch floppy disc with a capacity of 630 Kbytes.

The 4/60's new hard disc has a rugged design with reliability features. A double shock and vibration isolation system ensures data integrity during shipping and handling of the computer.

"With the introduction of the Vector 4/60, we can offer buyers a greater choice of configurations to match their requirements," said Martyr. The Vector 4 series now includes the Vector 4 intelligent workstation, with no local disc drives, intended for use with the Vector local area network; the Vector 4/10 with one floppy drive; the 4/20 with two floppy drives; the 4/30 with a 5 Mbyte Winchester; the 4/40 with a 10 Mbyte Winchester, and the new 4/60.

All Vector 4 computers have both 8-bit Z80 and 16-bit 8088 microprocessors, giving the user access to more than 1,000 applications programs developed for the 8-bit processor as well as the growing selection of programs developed for 16-bit machines.

The Vector 4/60 will be sold complete with CP/M-86 operating system, Memorite III word processing and the ExecuPlan II financial planning package. As standard, the machine will be shipped with 128K of RAM but a 256K version will also be available.

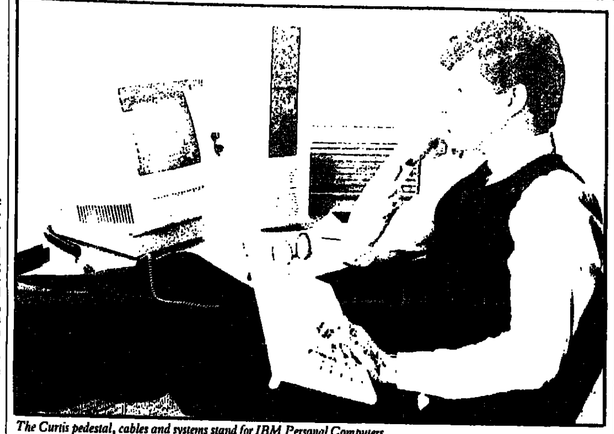
UK prices for the new machine have not yet been fixed but are expected to be about £9,000.

In addition to the software packages included with the 4/60, Vector offers a wide variety of optional software. Forecasting ExecuModeler automatically builds customised ExecuPlan models for forecasting, Accuchart creates printed charts and graphs, Milestone uses critical path analysis to help track and manage projects, DataManage is a record and file management program, and Conect provides asynchronous communications access to public databases and other computers.

An increasing number of vertical market software packages for the Vector 4 are available to Vector dealers through the Vector Quest Business Software Marketing and Information Service.

Many other new software packages, high-level languages and graphics software will soon be available as a result of a technology exchange and licence agreement between Vector Graphic and Digital Research.

**Vector Graphic (CW), Vector House, William Street, Windsor, Berks SL4 1BA. Tel: Windsor 69375.**



*The Curtis pedestal, cables and systems stand for IBM Personal Computers.*

# Tilt and swivel for user comfort

*WITH the new Curtis pedestal and extension cables for IBM Personal Computers the user can tilt or swivel the display unit for maximum comfort, and position the hardware as he wishes.*

*The pedestal is sturdily built and the colour matches the IBM. It costs £79.95, delivery and VAT included, from Chell Instruments.*

*Also available are extension cables so that the system can be arranged as the user wants. A 3ft monochrome display and power extension cable set costs £49.95 and a 3ft to 9ft coiled keyboard extension cable costs £39.95, both prices including delivery and VAT.*

*Both cable sets are fully shielded and are fitted with connectors to maintain the maximum integrity of the hardware.*

*There is also a systems stand for disc drives, which costs £24.95 inclusive.*

***Chell Instruments (CW), Tudor House, Grammar School Road, North Walsham, Norfolk. Tel: (0692) 402488.***

# Power to the desk top user

THE computing power of the Motorola MC68000 16/32-bit microprocessor is now available to the desk-top user in the form of the new Hewlett Packard Model 16 micro system being distributed by Crellon Microsystems.

The Model 16 system is designed specifically for technical and scientific users and professional executives.

Specialist software package applications include AC circuit analysis and digital filter design, numerical analysis, project management, graphics presentations, word processing and spreadsheet planning tools.

Among the features of the Model 16 are the new 3½in micro floppy disc units – single or dual drive – providing fast, reliable program and data access. Winchester discs are also available with either 4.6 or 10 Mbyte drives. Compatible peripherals include low-cost graphics plotters, graphics tablet and printers.

Other features include 540K memory, expandable to 4.6 Mbytes (with optional card cage); unique rotary control for easy interaction; 300x400 pixels high resolution graphics, and optional 512x512 colour display; HP-IB (IEEE 488-1978) and serial interfaces; slots for plug-in interface cards and additional memory; five languages – HP Basic, Pascal, Assembler, Fortran 77, and Multi-Forth; and shared resource management with up to 68 users.

**Crellon Microsystems (CW), 380 Bath Road, Slough, Berkshire SL1 6JE. Tel: (06286) 4300.**

# Acoustic coupler for the Osborne

A RANGE of acoustic couplers designed for use with many of the leading microcomputers is announced by K. & N. Electronics.

Based on the company's KN800 series, the first model is designed for use with the Osborne portable microcomputer. Called the KN890/OS, it is recommended by the maker of the Osborne and accepted for use with the public switched telephone network by British Telecom.

Operational specifications of the KN890/OS include a data transmission rate of 30 characters per second, full duplex operation and an output which conforms generally to RS232-C but which has an interface suited to the Osborne.

Housed in a lightweight case, it features self-sealing rubber acoustic cups which provide immunity to ambient noise. The cups are adjustable to suit most European and American handsets including the British Telecom 700 series.

**K. & N. Electronics (CW), Cordwallis Street, Maidenhead, Berks. Tel: (0628) 22447.**

*The KN890/OS from K & N Electronics.*

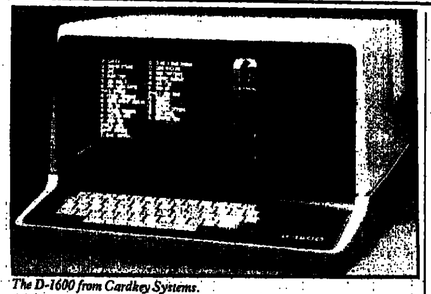
# Software for estate agencies

AS PART OF a development programme to provide a full range of software for estate agencies, Parkhurst and Company, the South Wales based estate agent, has announced a personnel system, consisting of three modules: basic payroll, statutory sickness pay and personnel records.

The payroll module will handle hourly, weekly, and monthly paid employees, and payments selected from cash, cheque, or credit transfer as appropriate. It will also handle company pension deductions, and up to five emoluments and 10 deduction headings on a user defined basis.

The statutory sickness pay module meets DHSS requirements, automatically calculates qualifying and non-qualifying days, and transfers the information to the payroll each week or month.

**Parkhurst and Company Computer and Software Division (CW), Phoenix House, 88/89, High Street, Swansea SA1 1LW. Tel: (0792) 462253.**



*The D-1600 from Cardkey Systems.*

# Security controller

AN access control and security management system, which combines access control, alarm monitoring, and closed circuit TV monitoring in one security package, has been launched by Cardkey Systems.

Called the Cardkey D-1600 the central computer console can monitor and control up to 32 reader-terminals and up to 4,100 card holders.

In practice, when a specially coded card is inserted into the reader a signal is sent to the D-1600 central console which verifies all the conditions required for authorised access, and immediately grants or denies access. Transaction details are displayed in plain language text on the controller's 9in screen.

In addition, up to 256 alarm contacts can be monitored 24 hours a day, seven days a week, by the system.

**Cardkey Systems (CW), 23 Studium Way, Portman Road, Reading, Berks. Tel.: (0734) 415217.**

# Taking the risk out of CAD/CAM technology

THE Comet is a low-cost, mechanical CAD/CAM system with the functionality and expandability of much larger systems at a standalone workstation price, says Graphics Technology Corp. The Comet, based on 32-bit CPU architecture, provides customers with the ability to upgrade from one to 12 workstations without obsoleting initial hardware or software purchases.

"For the first time, people who have not been able to take advantage of CAD/CAM technology can now do so without risk," explains Graftek president Cy Lynch. "For less than $100,000, a customer has a production-ready 3-D mechanical design system with a top-of-the-line colour workstation.

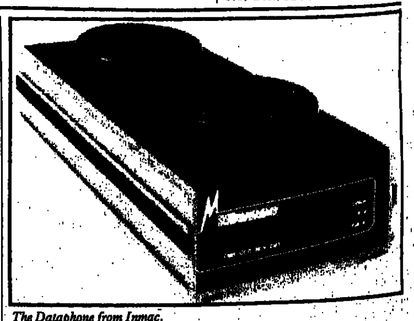
"As his production demands increase, the customer can add on the necessary software applications and/or hardware pieces to meet his new needs, without trading-in, replacing or duplicating any of his existing hardware or software. Because the Comet is modular, the original investment is protected."

The Comet has been designed as a compact unit for the office environment. The baseline configuration consists of a 32-bit CPU with one Mbyte main memory; 160 Mbyte Winchester disc drive; 45 Mbyte cartridge tape unit for disc back-up and archival storage; one 16-colour Meteor workstation; Geometric Modelling Software (GMS) for two and three dimensional mechanical design, including such options as drafting, extended geometry, and symbols; and Agile, Graftek's high level user programming language which has access to the functionality of GMS.

The Meteor, the intelligent workstation designed and manufactured by Graftek, features a high resolution (1024x768), 60 Hz non-interlaced colour display, enhanced by an anti-glare filter for a clear, flicker-free image and reduced eye fatigue. Standard to the Meteor for the Comet system are local pan, zoom, and entity pick functions which greatly increase the speed of graphics manipulations while reducing CPU processing requirements.

Also included is entity dragging which facilitates symbol placement and entity translation functions.

**Graphics Technology Corporation (CW), 1777 Conestoga street, Boulder, Colorado 80301. Tel.: (303) 449-1138.**



*The Dataphone from Inmac.*

# New design in modems

WITH rapid developments in microcomputers and software giving powerful systems that are truly portable, there is an increasing need for modems to link these machines together or to larger computers via the telephone from home to office, between offices or anywhere out in the field.

Inmac has announced a new design of modem called Dataphone which is designed to fit almost any phone using a cup design.

This acoustic coupler is rated up to 300 baud and can operate in either duplex or half-duplex mode. Signal indicator lights show the status of either ready to use, ready for transmission, received data present or transmit data present. The connection from the Dataphone to the computer is via a standard RS 232 Female socket.

**Inmac (CW), Davy Road, Astmoor, Runcorn, Cheshire WA7 1PZ. Tel.: (09285) 67551.**

*The Quest Micropad — now available working in conjunction with the Altos microcomputer, providing a written data entry system that interprets letters into computer instructions.*

# Handwritten system

A TELEPHONE sales system has been developed to run using Quest Micropad direct data entry on an Altos microcomputer.

It will analyse and process sales enquiries and orders received by telephone as a result of advertising campaigns, or record details of telephone sales calls as well as market research applications, say the developers.

Telephone sales staff write directly on to a specially printed pad linked to a Micropad, which transfers the letters into computer instructions. This data is fed into the Altos for analysis and display. It will printout delivery instructions and labels so that brochure requests for goods can be despatched quickly.

A system has been installed with a major telephone sale company in London and was recently used to deal with brochure requests for a travel company.

The users claim that using the Micropad has doubled efficiency.

**Logitek (CW), Logitek House, Bradley Lane, Standish, Greater Manchester WN6 0XQ. Tel: 0257-426644.**

# Midlectron introduces range of low-cost business micros to UK

MICROCOMPUTER distributor Midlectron has signed a sole distribution agreement with California-based Morrow Designs to market its range of business microcomputers in the UK.

Called the Micro Decision, the machines are supplied with a suite of business software packages for a basic price of £1,020 without a screen. This price is less than the total retail cost of the software packages included when they are sold separately.

The hardware is Z80 based, with 64K RAM as standard, an on-board disc controller, and a choice of disc storage ranging from two 5¼in drives offering 250 Kbytes (unformatted) per disc to two double-sided 5¼in drives offering 500K (unformatted) per disc.

An expansion port allows the Micro Decision to handle up to four add-on disc drives. Two RS232C ports allow communications to a terminal and a printer or modem.

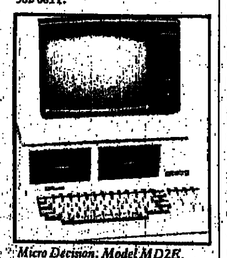
Midlectron will supply the Micro Decision with any of the terminals it stocks, including the new TeleVideo 914 when it is released shortly.

The standard software supplied includes WordStar and Correct-It a spelling check program; and electronic spreadsheet program called Logic-Calc, and two programming languages; Microsoft Basic-80 and Basic. The operating system is the industry standard CP/M 2.2.

Morrow Designs has also made the system easier to operate at programmer level as well as for the business user. A menu-driven front end for CP/M displays the full range of CP/M functions.

All error messages are in plain English, not error codes, and "trap" the error to be corrected before any damage can occur. Automatic power-on diagnostics test all 64K of RAM and the system PROM.

**Midlectron (CW), Nottingham Road, Belper, Derby. Tel: (077) 382 6811.**



*Micro Decision, Model MD2E.*

# Monochrome monitors

TWO monochrome monitors for educational and industrial applications have been introduced to the UK by Reflex. The 9in and 12in monitors are made in Canada by Electrohome.

The devices offer displays of 24 lines of 80 characters. Reflex says the 18MHz bandwidth gives a high resolution of 800 lines per frame. Both versions can have P4 black-and-white or P31 green phosphor screens.

The monitors use an asynchronous power supply with phase lock loop control to ensure a stable display regardless of mains frequency.

**Reflex (CW), 44 Gallys Road, Windsor, Bucks SL4 5RA. Tel: (07535) 64327.**

# MARKET PLACE

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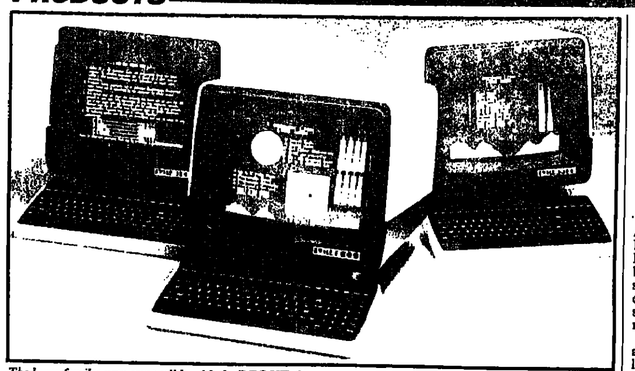


*The Lyme family: now compatible with the DEC VT100.*

# Lyme terminals DEC compatible

USERS now have a UK-built alternative to Digital Equipment's VT100 display terminals. Gresham Lion Electronics has introduced software which makes its Lyme 5500 and 6000 terminals compatible with DEC's VT131 specification. The software includes the Advanced Video Option feature, plus a block transmission edit facility for data preparation.

With the edit feature any attribute – for example bold or colour text – can be defined as being protected. This means the fields keep the attributes when data is erased and when new data is entered it takes on the colour or other attribute. Different fields can be entered and checked and sent as one block to the host computer.

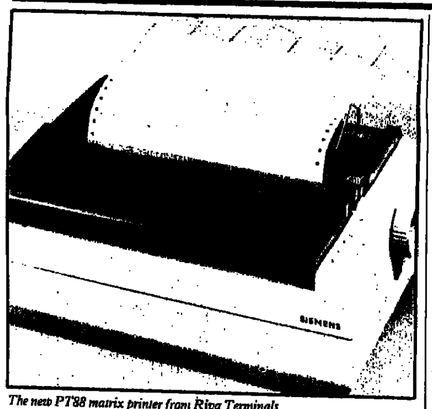
The standard command set of the Lyme terminals is based on the DEC VT52, so the new option means there is code compatibility across the range.

Standard features of the Lyme range include eight-page memory; page scrolling; 80- or 132-column display; the ability to write to other, undisplayed pages; editing; and 48 programmable functions.

Options include up to three alternative character sets – the user can define the 127 characters in each set, if necessary – plus graphics. The graphics facility is added by plugging in an extra circuit card. Options include 512 picture elements by 256 and 400 by 300 in black and white or 256 and 400 by 300 in colour.

Recent enhancements include an optional touch-sensitive screen and a colour printer.

**Gresham Lion Electronics (CW), Gresham House, Twickenham Road, Feltham, Middlesex TW13 6HA. Tel: 01-894 5511.**



*The new PT88 matrix printer from Riva Terminals*

# Printer cuts the noise

RIVA Terminals has announced the low-cost Siemens PT88 matrix printer for the microcomputer market.

The PT88 comes with an ink-jet printing mechanism for quiet, high speed, high quality printing, and the PT88n with a needle printing mechanism for applications which require copies.

The announcement follows the signing of a marketing agreement between Riva Terminals and Siemens.

The ink-jet printing mechanism of the PT88 eliminates the noise associated with conventional printing techniques says Riva.

The PT88 optimises bi-directional printing at speeds of 150 characters per second on the ink-jet printer and 80 characters per second on the needle printer. A related faster ink-jet model operates at 270 cps. The new printer interfaces via a serial asynchronous RS232C or parallel Centronics-type 8-bit interface to most types of microcomputer.

**Riva Terminals (CW), Woking Business Park, Albert Drive, Woking, Surrey. Tel: (04862) 71001.**

# Plotting at a distance of four miles

THE Versatec Acris system, a new development in aperture card reading, is a raster input scanner which enables the user to digitise silver or Diazo film aperture card images for direct plotting on Versatec 11, 22, 24 or 36-inch electrostatic plotters.

An AO drawing of average density can be scanned, enhanced and plotted within one minute, says Versatec.

Substandard aperture cards can also be plotted. Image enhancement features include thresholding, background adaptability, line detection and line growth minimisation. Self-calibration of lamp and density concurrent with the initial lines of each scan maintains image quality, and functional diagnostics provide continuous monitoring.

Used locally, drawings can be sent to a Versatec plotter 1,000 feet away via conventional cables. An optional high speed fibre optic link, recently launched by Versatec, allows full speed plotting at distances of up to four miles.

Acris, which scans 200 lines per second, reads up to three cards per minute with output resolution of 200x200 scans per inch, and plots can be scaled up or down in size. Using an appropriate Versatec plotter, Acris can produce A4 to A0 size drawings.

**Versatec Electronics (CW), 27-35 London Road, Newbury, Berkshire RG13 1JL. Tel: (0635) 42421.**

# Launch of miniature keyboard range

INTRODUCTION of a range of low-cost miniature 55-key qwerty keyboards, the Series 55 is announced by McMurdo Orcom. Measuring 238×115mm (9.4×4.5in) or 280×176mm (11×6.9) inclusive of case, all are designed to overcome space limitations experienced by manufacturers of terminals, personal computers, medical electronics and automatic test equipment.

The series uses a three-layer polyester film membrane switch matrix beneath a mat which in turn supports the keytops and provides smooth positive tactile operation.

Interfacing is organised as an 8 by 8 matrix terminated in two flexible printed circuit tails fitted with 2.54m (0.1in) pitch connectors. An additional plug-microprocessor board provides parallel or serial Ascii encoded data outputs.

Parallel transmission is TTL positive logic in seven data bits plus odd or even parity, with strobe. "Handshaking" is available as an option. An internal power on reset signal initialises the program at switch-on. Serial data transmission is either RS232C or current loop with selectable data rates from 300 to 9600 bauds.

Encoded keyboards operate in four modes: unshift, shift, control and control shift, with auto repeat on all keys. Shift lock, which is performed electronically, is indicated by a front panel-mounted LED.

**McMurdo Orcom (CW), Rodney Road, Portsmouth PO4 8SG. Tel: (0705) 735361.**

# Teaching at the touch of a button

A NEW teaching machine, the ITM Grundy Tutor Mk.II, from International Tutor Machines, is based on a hardware package consisting of the Grundy New Brain desk-top microprocessor, a cassette recorder, and a visual display monitor.

The microprocessor, which has a full-size keyboard with standard layout and full-travel keys, produces characters in black on green on the monitor.

The Tutor's software, stored on magnetic tape, consists of a current library of over 70 complete courses on subjects which include applied mathematics, thermodynamics, electronics, chemistry, business computers, theory of flight, and double entry bookkeeping.

The teaching method is based on interactive programming, whereby the VDU asks questions of the student who presses the appropriate button on the keyboard to reply. Depending on the quality of the answer, the VDU will either direct the student to the next step, or refer him back to revise earlier steps.

Some of the outstanding advantages claimed for the new system are that it permits the student to learn at his own pace, to study at the time, and in the environment which is most suitable for him, and to revise each step thoroughly before advancing.

Similarly, the "friendly" interaction of student and teaching machine ensures that the student can advance to his appropriate level in the course, without repeating earlier tuition.

In many educational establishments, existing computer facilities are generally reserved for the science students. The cost of the ITM Grundy Tutor Mk. II now gives students of the humanities the opportunity of using this advanced method for their subjects, says ITM.

The new teaching machine is said to be ideal for language courses which will be added to the ITM library shortly.

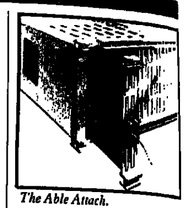
Apart from academic subjects, other applications for the ITM Grundy Tutor Mk.II are in skill centres, training programmes for the armed services, and technical re-training generally.

The NewBrain Microprocessor is a personal computer which, with the addition of a printer, can be used as a word processor – an additional boon for a teacher preparing work after school hours.

The ITM Grundy Tutor Mk.II is descended from the electro-mechanical teaching machines pioneered by ITM some 20 years ago. These machines were costly, and their use inhibited by the high level of maintenance required, and the initial expense of the courses which were contained on 35mm film. Microprocessor technology has overcome these difficulties, and some of the most authoritative tuition courses covering a wide, and increasing, range of subjects are now available to teacher and layman alike, says ITM.

**ITM (CW), 15 Holder Road, Aldershot, Hants.**

*The ITM Grundy Tutor Mk. II.*



*The Able Attach.*

# New concept in multiple connections

ATTACH is a concept from Able Computer, connecting multiple communication lines to one or more computers. The new system is compatible with Digital Equipment Corporation's Vax, PDP-11, DEC System 10 and System 20 computers.

The Attach system allows up to 128 terminal lines to be connected via a single composite cable. Terminal clusters can be remotely located up to 1km (0.6 miles) from the host interface.

Data integrity over the long line is assured by the intelligent Attach interface which uses synchronous protocol for error detection and recovery. A host adaptor module installed in the computer converts the messages received from Attach into an interface recognisable by the host computer software.

The hex size Attach host interface will logically support up to 128 terminal lines, yet requires less power, mounting space and bus loading than existing 8 or 16 line multiplexer boards, says Able.

The Attach system includes eight-line line adaptor modules with the capability of "hot" replacement for superior systems support. Each module in the Attach system has its own on-board diagnostics that automatically activate at each power-on. The supervisor control also can initiate the diagnostics independently.

Other features of Attach are the ability to support multiple host adaptors, allowing system back-up configurations as well as performing a basic switch function. The supervisor allows the reassignment of terminals to different line identities or even to a different host.

A printer port is provided to allow for a hard copy record of all system configurations, providing improved security. The modular hardware building blocks of the system permit easy installation, expansion in eight-line increments, and repair.

The first implementation of Attach will be a remotely locatable large line application with multi-host capability.

**Able Computer (CW), 287 London Road, Newbury, Berkshire RG13 2QJ. Tel: (0635) 32125.**

# First of laser printer family

DIGITAL Equipment has announced the first of a family of high speed printers which will use laser technology to produce book quality text at the speed of a computer line printer.

The new model, the LN01, employs electrophotographic imaging and xerographic printing, which means that every page printed is an original. It is capable of printing 12 A4 pages a minute and is available to users of Digital's Vax systems.

The LN01 has a graphics capability which embraces logos, signatures ad half-tone images; and is quiet because of its non-impact operation.

The printing process involves the formation of a latent electrostatic image by a laser beam selectively discharging areas on the surface of an electrically-charged photoreceptive drum. A visible image is formed on the drum's surface by attracting a dry ink; then the image is transferred to paper and permanently fixed by means of a fuser assembly.

The LN01 is designed for many applications and is suited for production volumes of up to 15,000 pages a month.

**Digital Equipment Company (CW), Digital Park, PO Box 110, Reading RG2 0TR. Tel: (0734) 868711.**

*Digital's new LN01 laser printer.*



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(5168)

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# Computer operations and support manager

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**Following a recent review of the Company's Information Processing Strategy, and the enlargement of its systems team in Norwich, a vacancy has arisen for the new position of Computer Operations and Support Manager.**

Reporting to the General Manager, Information Systems, the successful applicant will be responsible for the operation and control of Colman's computing facilities.

These comprise a growing number of computers on site as well as a Remote Job Entry facility and a large number of on-line terminals linked to an IBM 3032 in Hull. By the end of 1984 full operational control of all job submission and processing (including job recovery and reruns) for Colman's systems on the IBM 3032 will be his/her responsibility.

The job holder will also be responsible for the planning and acquisition of hardware (in line with company strategy), for liaising with hardware suppliers over maintenance contracts and engineering support, and for providing an operational support service for all installed hardware within Colman's. In addition, he/she will control all consumables associated with the installed hardware.

The co-ordination and implementation of a disaster recovery plan and security dumping of production systems will be a basic part of the Operations and Support Manager's duties.

Applicants for this senior position must have several years' experience of computer operations and support in a multi-user, multi-shift environment, including a sound knowledge of job control procedures and associated software (e.g. DCMS) for all systems on the IBM 3032.

Colman's of Norwich is part of the multi-national Reckitt & Colman Group and the post carries the usual benefits associated with a large progressive Company.

**Applications, giving full details of qualifications, experience and current salary, should be sent to Mr. J.E. Barley, Personnel Department, Colman's of Norwich, Carrow, Norwich, NR1 2DD to reach here by Monday 5th September, 1983.**

Colman's of Norwich

The Lovell Construction Group is expanding its head office computer department located in Gerrards Cross and will soon be taking delivery of an ICL 2957 using VME/TPMS/DDS/IDMS. We now have the following vacancies:

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For further details and an application form please contact: G. C. Lee, Personnel Manager, Lovell Construction, Marsham House, Gerrards Cross, Bucks SL9 8ER. Tel: Gerrards Cross (0753) 882211.

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**If you are interested in an exciting career with this new venture forward a detailed c.v. or telephone: The Personnel Officer, Cabletime Limited, 17 West Mills, Newbury, Berkshire. Tel: Newbury (0635) 48222.**

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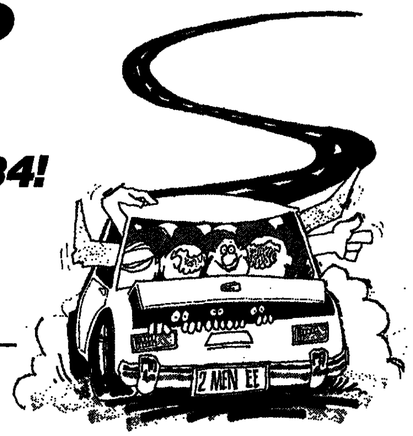


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ANALYST/PROGRAMMERS with PL1, IMS, ADF, TSO/SPF or Datapoint Databus, Dateshare
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### HOLLAND
Contact: BILL TORBITT or BILL EVANS
6 months + Assignments starting August/Sept
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IBM COPICS Programmer Analyst
IBM Systems Programmers with either:
VM, DOS/VSE, CICS or OS MVS
Motorola 68000 Designers

### USA
Contact: STEVE WHITING
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IBM COBOL with IMS or DL1
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IBM Network Controllers
ICL VMEB Operators
Contact: ALAN PAINE, MARK ATKINSON
or LYN ADAMS

## PERMANENT
## 0252 516141

URGENT SALES OPPORTUNITIES
Contact: FRED BRAMLEY

| | |
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| Mini-Micro Sales Executives, target earnings £25k | Ref: F82 |
| Financial Systems Sales Executives, target earnings £25k | Ref: F81 |
| Chief Programmer and Progs. with IBM COBOL CICS DL1, Surrey to £13k + excellent benefits | Ref: J115 |
| IBM Sys 34 RPG II An/Prog. c £10k, City | Ref: J169 |
| ICL COBOL Progs. Surrey/Middlesex to £9.5k | Ref: J169 |
| Honeywell Progs. or An/Progs. with IDS and TDS, Surrey to £11k | Ref: J163 |

Contact: PETER JEZEPH for an immediate confidential interview or write, enclosing a detailed c.v.

(6187)

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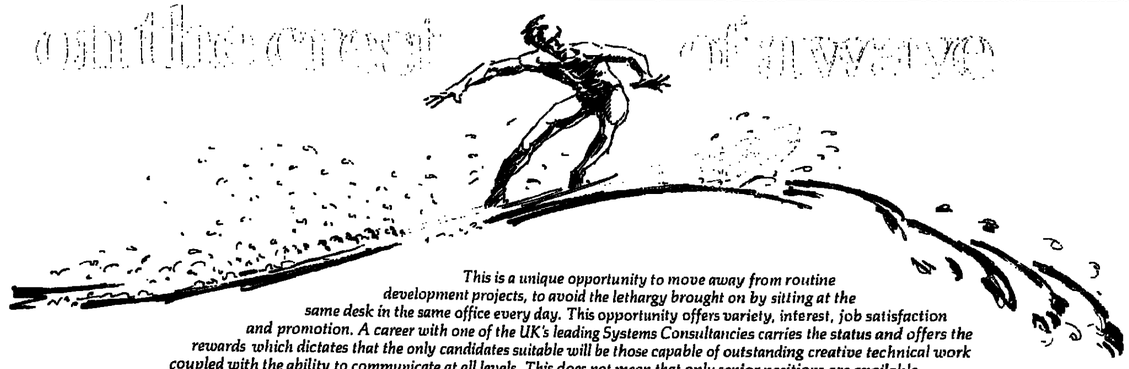
# on the crest of a wave



*This is a unique opportunity to move away from routine development projects, to avoid the lethargy brought on by sitting at the same desk in the same office every day. This opportunity offers variety, interest, job satisfaction and promotion. A career with one of the UK's leading Systems Consultancies carries the status and offers the rewards which dictates that the only candidates suitable will be those capable of outstanding creative technical work coupled with the ability to communicate at all levels. This does not mean that only senior positions are available, but that candidates must be able to prove their ability to progress into senior consultancy roles within a relatively short period of time.*

## CONSULTANCY IN COMMUNICATIONS
## £12,500 to £18,000

Senior systems designers and analysts are required to join an advanced technology division of the company, working on system performance and design aspects of a number of new development projects in the Defence field. Experience of working on systems or sub-systems of any major communications development would be useful, although general experience within communications systems design, analysis or programming would be of interest.

There are a variety of hidden benefits to these positions, other than an excellent and attractive income package. The projects will generally be within the area of future requirements analysis and design spanning the next couple of decades on behalf of a number of organisations, breaking completely new ground in fields only lightly investigated up to now. This will include selection and evaluation of Hardware and Software without any pre-determined preference or affiliation with suppliers.

## DEFENCE SOFTWARE CONSULTANCY
## £10,000 to £15,000

CORAL/MASCOT/VAX/DEFENCE APPLICATIONS. Development project team leaders, senior designers and senior software programmers will find a very wide range of tangible applications areas developing talents far beyond the potential experience achievable elsewhere. These fields include:

* Command, Control and Communications
* Distributed data processing
* Expert Systems
* Advanced Software Engineering
* Naval and Land-based Weapons Systems

There are also some specific requirements for senior projects managers capable of business area development.

Salary packages will be commensurate with both current experience and future potential, and applications are invited from candidates with two to ten years experience. The company consists of young, energetic and imaginative people, and is expanding at the rate of 30% per annum. It is envisaged that this will continue and will result in many promotion opportunities being offered within realistic timescales.

## CONSULTANCY IN SIMULATOR DESIGN DEVELOPMENT
## c. £14,000

There is an immediate opening for an experienced senior systems engineer to contribute to the company's expanding simulator business. The position will be based in either Central London or Surrey, and will involve taking senior level responsibilities for current projects in addition to developing the company's activities in this field. Candidates should have proven simulator design expertise preferably within a defence-related industry and must be prepared to negotiate on behalf of the company at high levels.

## SENIOR ELECTRONIC DESIGN ENGINEER/PROJECT MANAGER
## £14,000 to £16,500 neg.

Project Managers and Leaders are required to provide technical leadership to existing project teams designing Defence Systems. The opportunity to work on advanced digital electronic prototypes for various applications will provide a much wider range of experience than can usually be expected. Senior level positions often involve working with more than one project team at any one time and therefore the ability to coordinate activities to make the most effective use of working time is important. Young engineers with positive drive and ambition will find these positions particularly rewarding.

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# COMMUNICATIONS SOFTWARE

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The International Distributed Systems Centre (IDSC) of Sperry, Product Division, is a software development centre of 50 professional staff specialising in customised networks and advanced data communications throughout the world. We are looking for self-motivated, highly qualified software specialists with a proven track record in data communications and distributed processing. Applicants should have 3-5 years experience of at least three of the following:

*1100 Real Time Software (CMS, TIP, Telcon)
*Handler Development (Bisync, TTY, X25)
*Architectures (ISO, CCITT, SNA, DECNET, DCA)
*Networking
*New Services (Videotex, Teletex, Cable TV, Satellite)
*SQA and support of data networks
*Banking Terminals

## New Graduates

We are also seeking up to six new or recent graduates preferably with a Computer Science degree who will be trained within the development and support groups. This will give those with less experience the opportunity to acquire the skills required in this complex and challenging software environment.

IDSC is located in an attractive self-contained facility in central London with easy access from Paddington, Marylebone and Baker Street stations. There is also a significant opportunity to travel both to the USA and throughout Europe. Currently there are projects whose customers are in Finland, Sweden, Germany, Switzerland and Singapore.

Please phone or write sending C.V. to: P. Murray, IDSC, 45 Crawford Place, London W1. Tel: 01-402 7221

SPERRY

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**PROGRAMMING TEAM LEADER** — **CITY** — **to £13,000+MORTGAGE**

This prestigious firm of Merchant Bankers based in the CITY wish to recruit a Senior Programmer to lead a team of programmers. They retain IBM 4341 running under DOS/VSE VM using COBOL, CICS and DL/1. This is a super opportunity for a programmer to make a career move. If you have THREE YEARS' COBOL with some exposure to CICS & DL/1, ring now.

**PL/1 PROGRAMMERS** — **C. LONDON** — **to £14,000**

Major expansion within this progressive company has led to vacancies for all levels of programmers. Opportunities exist for applicants with a minimum of 18 months' PL/1 experience up to TEAM LEADER level. Our client offers TRAINING IN CICS AND DL/1, LARGE NEW DEVELOPMENT PROJECTS, rapid promotion, TRAINING in Analysis and excellent fringe benefits.

**COBOL PROG/ANALYSTS** — **C. LONDON** — **£11,000 NEG**

This international company based in Central London seeks to recruit career minded individuals to enhance their young dynamic D.P. dept. They retain IBM 4341 running under MVS using COBOL CICS and DL/1. If you have a minimum of TWO AND A HALF YEARS' IBM COBOL, in return they can offer TRAINING in CICS AND DL/1, large development projects and TRAINING in Analysis.

**ANALYST** — **CITY** — **£13,000 NEG+MORTGAGE**

Our client, an International Bank with impressive city office seeks to recruit an ANALYST to work on large financial projects. Ideal applicants will have a minimum of ONE YEAR'S ANALYSIS and an IBM CICS PROGRAMMING background. Banking experience is not necessary as full training offered.

**SENIOR COBOL PROGRAMMER** — **C. LONDON** — **£11,000 NEG**

Our client seeks a Senior Programmer/Team Leader Designate to run a team of Programmers. They are looking for a minimum of THREE YEARS' IBM COBOL, preferably someone with some supervisory experience and a confident personality. They retain IBM mainframes running under DOS/VSE and offer TRAINING in CICS & DL/1.

**COBOL PROGRAMMERS** — **CITY** — **to £10,000+MORTGAGE**

This city based Bank are looking for two Programmers to work on an International Banking Project. Applicants should have a minimum of 12 MONTHS' IBM COBOL and 6 MONTHS' CICS. Ideally you should be ambitious as promotion to Team Leader within 18 MONTHS is envisaged. Co. offers excellent Banking benefits.

**PROJECT MANAGER** — **MICROS** — **to £13,000**

This prestigious city-based firm seeks a Project Manager to head a NEW MICRO-BASED INFORMATION CENTRE. Individual will carry out and control software projects. Company seeks a confident person aged between 25 and 35 who can communicate with all levels of staff.

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**To £10k**

Reporting to the Computer Superintendent the Operations Supervisor will assume responsibility for the day-to-day control of Data Processing, Communications and Bureau Services. Experience of supervision, working to strict deadlines, liaison with outside Bureaux and internal user departments are highly desirable.

Britannia Refined Metals Limited is a £100 million p.a. turnover subsidiary of a large overseas mining group. The refining of lead and silver from crude lead is carried out at the Company's Northfleet Refinery. Current Computer Services are based on an in-house mini computer with extensive telecommunications facilities and Bureau services.

**Please contact Robin Burnett, Personnel Services Superintendent, Britannia Refined Metals Limited, Botany Road, Northfleet, Gravesend, Kent DA11 9BC. Telephone Gravesend 51188.** (5190)

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**ICL COBOL PROGRAMMERS/ANALYSTS**

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Please telephone or write with brief details to the Personnel Officer, TIPS LTD, 209b High Street, Waltham Cross EN8 7AY. Tel: Waltham Cross (0992) 33208. (6201)



# SENIOR APPOINTMENTS – £14K +

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## THE UNITED BANK OF KUWAIT LTD.
## ANALYST/PROGRAMMER

**LONDON** — **To £14,000 + Banking Benefits**

The United Bank of Kuwait has been a dedicated DEC user for several years. The bank has recently upgraded to two VAX 11/780s one of which is solely deployed to development work. The position will be based at the bank's head office in the City at Lombard Street.

The successful candidate should have a solid programming background within a DEC environment to include at least one year with any VAX equipment. The ideal language would be MACRO 32 but the bank are prepared to retrain and therefore wish to interview analyst/programmers with MACRO II or any high level language. Applicants should be educated to a minimum of 'A' level standard and be good communicators but more importantly should have the ability and drive to join a small team of enthusiastic analyst/programmers working in a stimulating environment. Previous banking experience would be of special interest but by no means essential.

**To find out more about this excellent career opportunity please contact SEAN ORSLER on 01-404 4821.**

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(5189)

## RPG II/III

### IBM SYSTEM 38 MIDDLESEX
### To £13,500

Expanding software house based in North West Middlesex requires ambitious young analyst/programmers or programmers to join their development team. System 38 RPG III experience is preferred, although they are prepared to retrain good IBM System 34/RPG II people looking to progress. Excellent salary. REF. C/2659

### ANALYST/PROGRAMMER
### To £11,000

Established manufacturing company, London based, requires an analyst/programmer with a minimum of 2 years' RPG II on IBM System 34's. The successful applicant will be assisting in the development of a range of commercial systems including ledgers, producing control and costings, should have strong liaison skills, and the ability to work within a small team. REF. C/2651

### SYSTEM 38/BANKING
### £8-12,000

International City bank, currently expanding its D.P. Department, has requirements at all levels for IBM System 38/RPG III professionals. Any experience of banking or general finance would be advantageous, and successful applicants will be well rewarded in terms of salary and a full banking package including subsidised mortgage, cheap loans and non-contributory pension scheme. REF. C/2697

### RPG II/RETRAIN TO RPG III
### £8-9,000 Neg

Due to expansion in their Computer Department, this leading commercial company based in N.W. London require an additional programmer. The successful candidate should have a minimum of 12 months' experience either on the IBM System 38 or System 34 with either RPG II or RPG III. You will be working on development projects, utilising on-line and database facilities. REF. C/2695

### IBM SYSTEM 38 CITY
### £8-11,000

Highly successful financial brokers, are seeking to recruit 2 experienced IBM System 38 professionals. The senior position calls for an analyst/programmer with good technical skills gained within a GSD environment, with the ability to take projects through to implementation. The programmer should have 12 months RPG III experience gained on the IBM System 38. For both positions candidates must have a good educational background with at least 1 year's exposure to RPG III. You will be well rewarded in terms of salary and benefits. Please call for more information. REF. C/2694

### MOVE INTO MANAGEMENT! CENTRAL LONDON
### £12-14,000

First class career move for a competent senior analyst/programmer with experience on the IBM System 34/RPG II. The ideal candidate would have a number of years D.P. experience and be able to take a project through to implementation. You must be self-motivated and presentable and willing to travel abroad quite extensively. You will be groomed into this management position. If you feel you have the right capabilities and experience for this first class position please ring me as soon as possible. REF. C/2592

## IBM OPPORTUNITIES

### IBM COBOL, DL/1 (INTERNATIONAL TRAVEL) HANTS
### To £11,000

My client is offering an exceptional opportunity for a programmer/analyst to play a challenging liaison role throughout their European Sector. A minimum of 2 years' IBM MVS COBOL with DL/1 is needed, together with the diplomacy required to liaise with European Managers. You will be installing a financial system in both the U.K. and Europe, and initial training will be given in the U.S.A. Annual bonus, health and life schemes and full relocation package is offered. REF. C/2314

### PROGRAMMER/ANALYST
### £11,000 + discount on travel

New IBM 4331, DOS/VSE, CICS and DL/1 installation is offering a superb opportunity to an ambitious analyst/programmer. As part of a small team you will be expected to use your initiative, liaise with users and develop systems from very brief specifications. Two years' IBM COBOL is essential preferably coupled with some CICS and/or DL/1 experience. As a subsidiary of a large group, they offer a discount on travel. REF. C/2692

### IBM COBOL CITY
### £9,000

Can you offer 18 months' IBM COBOL experience? My client, a leading international bank would like to meet you. They are currently running an IBM 4341, with DOS/VSE utilizing CICS. Applications are all of a Banking/Financial nature with exciting new development projects on the way. Excellent banking package including subsidised mortgage, STL and LV's. REF. C/2662

### PROGRAMMERS/SENIOR PROGRAMMERS W/END
### £8-11,500

Here is an opportunity to join a world famous organisation. My clients require additional D.P. professionals to work in a small support group, and get involved with interfacing systems. The work is interesting and offers very good career prospects. If you can offer an IBM COBOL background under either DOS/VSE, OS/VS1 or VM/CMS, why not give me a call to discuss this exciting opportunity. REF. C/2693

### PL/1 PROGRAMMERS CITY
### To £10,000

I have been retained by a major international organisation to find IBM PL/1 programmers with a minimum of 18 months' experience. The company house IBM mainframes under MVS and OS/VS1. Experience of either CICS or IDMS and real time systems would be desirable as well as experience of working in a team environment. A generous salary is offered along with normal large company benefits. REF. C/2000

### ANALYST/PROGRAMMER PL/1 HERTS
### To £11,000

Large multi-national organisation who are market leaders in their field, are currently in the process of developing new systems. They are looking for an IBM Analyst/Programmer who has experience with PL/1 and on-line systems either gained with CICS, DL/1 or IMS (although training given). This position is offering career prospects, exciting development projects and a pleasant and flexible working environment. REF. C/1910

## OTHERS

### HEWLETT PACKARD – COBOL
### To £9,500

This major international manufacturing organisation, has recently installed a network of HP3000 machines. They are currently seeking an Analyst/Programmer with upwards of 18 months' D.P. experience and at least 6 months' HP/3000/COBOL expertise. Based in Berks, you will become involved in developing new financial and commercial systems. The successful applicant will be encouraged to do his/her own analysis and liaison duties. The package includes flexitime and 5 weeks' holidays per year. REF. A/2368

### HEWLETT PACKARD COBOL/SPL
### To £11,000

Can you offer a minimum of 12 months' experience on HP kit using COBOL and/or SPL? My client, based on the Herts/Beds borders, is currently seeking programmers and analyst/programmers to play integral part in the development of demanding and exciting development projects that will include Financial, Accounting, Commercial and Manufacturing systems. IMAGE, VIEW and RAPID would be assets, but are not essential as training will be given throughout your career here. There are also definite prospects for progression into analysis in the future. REF. A/1010

### HEWLETT PACKARD – ANY LANGUAGE
### To £13,000

My clients, a highly respected financial organisation based in the centre of London, are expanding and currently they seek an experienced individual, hopefully with a minimum of 3 years' HP3000 expertise and analysis skills. You will immediately become a senior member of a team dealing in the development of new financial systems, to an extremely high standard. Image and View are essential although language is unimportant as full training will be provided. An above average salary is offered, together with an excellent bonus scheme and £250 L.V.s per year. REF. A/0101

### DEC/PDP/VAX BASIC +2
### To £11,500

Applications are invited for Programmers and Analyst/Programmers with a minimum of 18 months + DEC and BASIC + 2 expertise to join this fast-expanding bureau organisation in the centre of London. Part of a multi-national conglomerate, my clients are embarking on a series of new projects in the commercial, financial and scientific sectors and seek ambitious individuals to carry this out. DEC/VAX expertise will be a definite asset, although training will be given to DEC/PDP programmers where necessary. Call me now for further details. REF. A/2645

### DEC/PDP 11/23
### £EXEC & RELOCATION

My client based in Herts is currently seeking to recruit an ambitious individual within excess of 12 months' DEC/PDP 11/23 experience. Training will be given in BASIC + 2 and MACRO II where necessary. You will become fully involved in developing highly sophisticated accounting and statistical packages, and the prospects are good for advancement into analysis. REF. A/2663

### DEC/PDP – FORTRAN
### To £11,500

Do you have two or more years' FORTRAN experience on DEC/PDP machines? My clients, a large industrial organisation, housing DEC/PDP 11/70 under RSX-11-M, are seeking to recruit an Analyst/Programmer to develop a variety of packages including Graphics, Scientific and Engineering Applications. You will become involved in user liaison, system configuration, software design and programming in a challenging environment. Based in Kent, they offer an above average salary. Call me now for further details. REF. A/1528

### TANDEM PROGRAMMER
### £8-11,000

An opportunity has arisen within this well established London based company for an ambitious programmer with 12 months + TANDEM/COBOL experience, to work in a financial environment. As they are currently expanding their programming department, this will mean an excellent career move for the right candidate. The total package includes top salary and full banking benefits. REF. M/2055

### DATA GENERAL
### c £7,000 + Car

My client, based in Essex, is currently looking for a Programmer who fills the following requirements. 18 months' + Basic or Business Basic experience, to become involved in the development of financial packages. Successful applicants will enjoy challenging work on a variety of assignments plus top rewards and excellent career prospects. REF. M/2677

### UNIVAC 1100-COBOL
### To £11,000

My client, a London based concern, part of a well-known retail chain is currently seeking to recruit Univac Analyst/Programmers. If you can offer 18 months + UNIVAC expertise, preferably in an on-line, database environment, you could be part of an expanding development team. Applications are of a manufacturing nature and will involve Stock Control and Accounting. Benefits include bonus scheme, discount on products and flexi-time. REF. M/2678

### WANG/ANY LANGUAGE
### £EXEC

An excellent opportunity to join this London-based company currently creating a new exciting package. They require at least 12 months' Wang VS experience with any language, and later your expertise will be required for user support and further development of other systems. Excellent opportunity for the ambitious individual who wishes to expand into analysis. REF. M/2671

### BURROUGHS SENIORS
### c £12,000

This major software house is recruiting now for Burroughs Seniors to work in the London area. If you can offer in excess of 2 years' Burroughs experience in the programming and/or systems field and you are now looking to earn in excess of £12,000 plus excellent company perks, then contact me now for further details of these outstanding opportunities. REF. M/2060

### ANY MINI COBOL
### £9-13,000

An excellent opportunity has now arisen within this central London software house for an Analyst/Programmer with a good COBOL background. Texas Instruments experience with DX10 would be preferred, but they will also consider good COBOL experience on other minis. Full company benefit package and promising career prospects for the right people. REF. M/2615

(5198)

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# Technical Manager

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## London Excellent salary

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We now require a Technical Manager to co-ordinate the design, development and programming of new data processing applications for the Bank's Overseas Branch System, and to provide technical guidance to Project Management and programming resources.

A minimum of 5 years' systems design and programming experience is essential, together with at least 3 years' experience of IBM System 38 facilities and technical attributes. A degree-level qualification is also required.

A highly competitive salary will be commensurate with experience, and a valuable benefits package includes profit-share scheme, mortgage subsidy, personal loan scheme, BUPA, interest-free season-ticket loan and, if appropriate, assistance with relocation.

Please apply in writing with full details of age, qualifications, experience and current remuneration to the Personnel Manager, Chemical Bank, Chemical Bank House, 180 Strand, London WC2R 1ET.

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# AIR CALL
communications

# SOFTWARE ENGINEER

Air Call is an International Computer and Communications Service provider which makes extensive use of 8 and 16 bit microcomputers in both data processing and control modes.

A vancancy has arisen within the Technical Services Division of the Company for a systems software engineer to join the Engineering Department.

The position which is based at the Company's technology centre at Dunstable will require a working knowledge of microcomputer hardware, the knowledge of at least one high level language other than Cobol, the ability to program in assembler and a familiarity with realtime operating systems.

The successful applicant will ideally be qualified to degree level and will have the necessary experience and enthusiasm to turn an operational or technical requirement into a working system.

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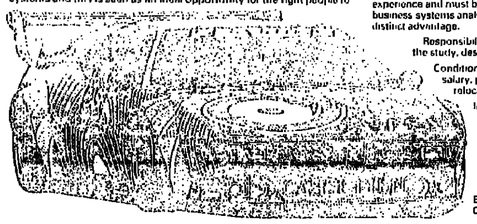

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Research Machines' product range is characterised by its quality, reliability, and long-term product compatibility. The company follows a policy of commitment to its users, which is reflected in its understanding of applications needs and very high level user support.

Our products include established high performance microcomputer systems; one of the few CP/M Local Area Networks available; and a comprehensive range of mature, high quality systems and applications software. An exciting new range of computers is in development.

*The successful applicant will:*

- ☐ *Prepare and maintain the sales plan to meet specified marketing objectives*
- ☐ *achieve sales targets, primarily through high value multiple sales to government and large industrial, research, and commercial organizations*
- ☐ *take over existing key customer accounts*

*We expect that your responsibilities over time will include recruiting and managing field sales personnel to support the development of this area.*

The qualifications we are looking for are

- ☐ A degree or equivalent
- ☐ the ability to negotiate high value sales at a senior level
- ☐ at least three years successful selling experience, preferably with a market leader in the computer industry
- ☐ wide-ranging understanding of hardware, software, and applications — a specific interest in the use of computers in training would be particularly valuable
- ☐ good grasp of finance at corporate, institutional, and government levels

**Research Machines is an established pioneer in a new industry and we offer opportunities for personal and career development in an environment which has high standards of professional and management practice. In addition to an excellent salary we offer a particularly attractive benefits package including car; 25 days holiday; free BUPA, life, and disability insurance; pension scheme and generous help with relocation expenses.**

*If you are interested in this vacancy please contact Polly Keane, on Oxford (0865) 726136 or by letter, for an application form, quoting reference* **SSEM/CW8.**

**RESEARCH MACHINES**
MICROCOMPUTER SYSTEMS

**RESEARCH MACHINES LTD** Mill Street, Oxford OX2 0BW. Tel: (0865) 726136

# INTERNATIONAL BANK, LONDON

*Programmer/Analyst* *to: £11,000 + benefits*
*RPG Programmer* *to: £9,000 + benefits*

## *Development Opportunities on S/38*

*Our client, based in NW London only three minutes from the tube, is currently engaged in a major development programme and need two more members for their small, friendly team.*

*DP facilities are provided by an IBM S/38 Model 7 at the Computer Centre supporting 45 terminals in six branches.*

*A second S/38 will be delivered shortly for the exclusive use of the Development team. The dynamic environment offers successful candidates every opportunity for career advancement.*

*Both positions require good RPG skills. Applicants for the senior position will have experience in program specification and file design.*

*Banking experience is not essential, but applicants with a knowledge of KAPITI will have a distinct advantage.*

*Benefits include:*

- ★ *Subsidised mortgage*
- ★ *Low cost loans*
- ★ *Free banking*
- ★ *Free medical insurance*
- ★ *Paid overtime*
- ★ *Interest-free season ticket loans*
- ★ *Luncheon vouchers*

*Ref BIR2 For further Information and Application Form:*

**EiGER** Management Limited

01-681 7748/2141

77 Wellesley Road, Croydon CR0 2AJ

*An ethical service from practising computing consultants*

(5087)

# WE'RE LOOKING FOR COMPUTER PERSONNEL WHO WANT TO WORK ON CONTRACT

If you are thinking of going contract or if your current contract is ending soon **we would like to hear from you.**

PFS was established 18 months ago as services and consultancy subsiduary of the Euribon Group. We are currently providing project teams, consultancy and individual computer staff to some of the country's leading companies to work on the various installations of differing manufacturers systems throughout the United Kingdom.

If you wish to be associated with a growing and respected company please send your c.v. or telephone the following:

**Neil Dennis**
**or Yvo Henneker-Heaton**
**PFS Computing (UK) Ltd.**
**Barker Gate House**
**Belward Street**
**Nottingham. NG1 1JY.**
**Telephone: 0602 580935**
**Or Derek Wadham at:**
**Thatcham (0635) 66923.**

pfs Project Facilities Services / Computing (U.K.) Ltd.

Service Offices in Nottingham, London, Birmingham, Frankfurt, Brussels

(4887)

## PROGRAMMER COBOL — to £9,000

An opportunity has occurred for a Programmer with a South London organisation utilising VAX 11/780 for the development of large database systems. They require around two years' commercial applications experience using any structured COBOL. VAX COBOL being especially welcome. Flexi-time working, bonus and cheap pension scheme go to complete the company package.

## ALL LEVELS ICL 2900 — to £11,000

A rapidly expanding Essex-based company has requirements for Analysts and Programmers through to Team Leader status. ICL experience which may include VME exposure is particularly relevant and at senior levels proven analysis or supervisory skills are necessary. Handling a large volume of the London insurance market, our client would especially welcome financial and insurance applications backgrounds. Benefits include profit share schemes and excellent promotion prospects.

## ANALYST/PROGS & PROJECT LEADER — to £15,000

Vacancies occur at various levels for persons with good BASIC, BASIC+, FORTRAN or similar programming backgrounds, preferably backed by working experience in a DEC environment. A proven project exposure involving the building of software for banking systems, data communications or message switching applications is desired as our client has a heavy commitment for development and support in all three areas. An attractive salary range, reviewed at six monthly intervals, supplemented by a generous company benefits package is offered.

## ANALYSTS ICL 2966 — to £12,000

A major manufacturing company, based in Hampshire, utilising ICL 2966 under VME is seeking several Analysts to augment its development teams. A commercial or financial applications background is required and exposure to ICL hardware is desirable. Every opportunity for advancement is available to Analysts with two or more years' experience within this market leading company.

## ANALYST/PROGS BURROUGHS — to £11,500

C. London company is currently looking for Analyst/Programmers to join their expanding team working on a variety of financial applications. Applicants should have around three years' COBOL to include 18 months' exposure to BURROUGHS systems. Any CMS experience will be of particular interest to our client. Successful candidates will enjoy a good deal of client contact and must be professional in both appearance and attitude. Good prospects and working conditions are offered.

## SALES SUPPORT LONDON — £14,000+

Expanding company are seeking experienced DP personnel to join their sales/sales support team. Applicants will probably have spent around eight years in DP, preferably with a manufacturing or accounting applications background, together with some pre- or post-sales support exposure. They should also have feasibility study and project management experience. As well as an excellent starting salary, benefits include a company car or generous car allowance, profit share and an interesting and challenging position.

## PROG & SNR PROG HP 3000 — to £11,000

Software house with an excellent reputation in the HP market seeks a Programmer and Senior Programmer due to planned expansion. The senior position requires three years' COBOL with knowledge of IMAGE and VIEW and the junior around 18 months. This is a good opportunity to work on a variety of projects and applications and for the senior the possibility of moving into analysis at an early stage.

## ANALYSTS C. LONDON — to £15,000

We have been retained by three London-based companies to find Analysts with varying levels of experience. A sound DP background is required with exposure to pension, payroll, insurance or accounting applications. Two of the positions are particularly interesting as they offer the chance for the Analysts to work in a consultancy role with a good deal of client contact. As well as good starting salaries perks are varied and include annual bonus and mortgage subsidy.

## GSD PROG/ANALYSTS RPGII/RPGIII — £NEG

We have many clients, all SYS 34 or SYS 38 users, who have current requirements for Programmers and Analysts. Applicants should have a minimum of six months' RPG gained in a commercial environment through to three years' + for the more senior consultant positions. The companies range from banking to manufacturing and offer a wide variation of benefits.

404 4821

**Apex Computer Recruitment Ltd.**

London Office: 59 Grays Inn Road, London WC1X 8TL. Tel: 01-404 4821.
Brussels Office: Rue Gatti de Gamond, 24. Ucde 1180 Brussels. Tel: 010 322 377 4193.

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# How many Analyst/Programmers do you know who work for some of the UK's biggest names?

Baric, jointly owned by ICL and Barclays Bank is one of the most successful computer service companies in the UK.

We're now looking for young Analyst/Programmers in their mid 20s currently seeking new challenges and an opportunity to move upwards in their career.

You should be interested in developing your technical skills in an environment where business awareness is as important as the technology. The work involves considerable customer contact in the solution of their specific problems.

We can offer a technically advanced site with a fantastic range of equipment including six ICL 2966s.

If you have 3 years' experience of COBOL on ICL mainframes, have worked in G3 DME or VME 2900 -- knowledge of FILETAB useful though not essential -- and have a degree, this is your 'open door' to a more dynamic environment than any we know of. Just what the highly motivated computer professional will appreciate, working with minimum supervision. If you like working to deadlines, organising your own priorities, we'll offer you a salary in the region of £10,000 plus a range of large company benefits.

Ready for the off? Write with a full c.v., or 'phone for an application form, to Miss Barbara Parsons,
Baric Computing Services Ltd., Forest Road, Feltham, Middlesex.
Tel: 01-890 1414 ext. 231.

BARIC
An ICL Barclays Bank Company

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## IBM

IBM 3033 MVS IMS systems analysts — urgent!
IBM PL1 OS programmer
IBM PL1 OS CICS programmer
IBM CICS Total Environ/1 programmers
IBM IMS DB/DC systems analysts
IBM OS Cobol programmer
IBM CICS DL1 Cobol programmers
IBM System 3 Systems analysts
IBM 4341 DL1 CICS senior analysts
IBM System 38 RPGIII programmers — various
IBM 8100 DPPX Cobol programmers
IBM VM TP System programmers
IBM 34 RPGII programmers

## BURROUGHS

Burroughs 68/6900 DMS GEMCOS Cobol programmers

## TANDEM

Tandem designers, programmers, analysts — various

## DEC

VAX Macro 32 programmers
VAX Datatrieve Cobol programmers
Systime VAX VMS with Systel Cobol programmers — very urgent!
VAX VMS Cobol programmers
VAX Mascot Coral 66 programmers

## ICL

ICL 2900 VME/IDMS Cobol programmers
ICL 2900 senior analysts
ICL 2900 IDMS database designer/programmers
ICL 2900 VME base support programmers
ICL 1900 VME/DME Cobol analyst/programmers
DRS CIS Cobol analyst programmers
ICL System 10 and 25 programmers — UK and Florida, USA
ICL 2900 VME operations consultant — urgent!

## HONEYWELL

DPS6 programmers — urgent

## OTHER

Motorola 68000 Pascal programmers
Motorola 6809 real time programmers
System X Coral 66 programmers
Computor Automation Opus 1 Transbasic

## OVERSEAS

HP1000 RTEA Fortran Assembler programmers — Brussels
SEL 32 MPX Fortran Assembler programmers — Brussels

**Tel: Hatfield (07072) 65555**

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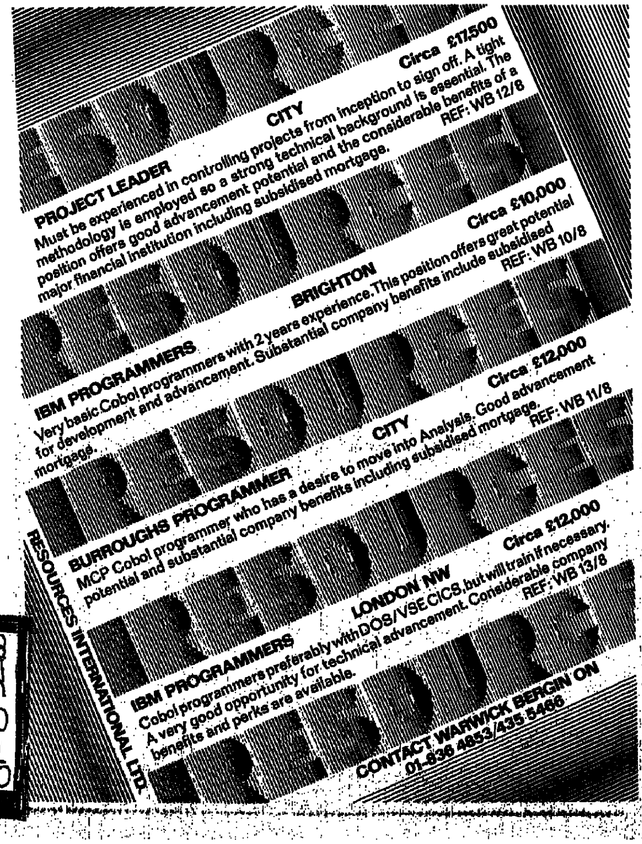


# COBOL

## *Your key to a challenging career*

"Do you have a minimum of one year's COBOL programming experience, gained in a commercial environment?" If so, this will open the door into the stimulating world of an expanding software house.

## SURREY — to £9,000

Take this opportunity to become involved in all aspects of software development on new projects on a range of ICL and other equipment. Previous experience in an ICL environment would, therefore, be an advantage. Promotion prospects within the company are excellent.

The company is based in SURREY, with easy access from the M23. In addition to the excellent salary, the package includes free life assurance and subsidised pension and BUPA.

Interested, then contact **Computant Limited Recruitment Agency, 14 Mount Pleasant, Tunbridge Wells, Kent.** Telephone: (0892) 35712/3/4. 24 hours answer phone.

Computant

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## RESEARCH AND NEW PRODUCT DEVELOPMENT
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...For an informal local discussion telephone, in confidence, IAN ...ER on Bristol (0272) 277195 or alternatively write enclosing de... ...c.v. to:

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*61 Park Street, Bristol BS1 5NU*
*Tel. 0272 277195*

# PUBLIC SECTOR APPOINTMENTS

## Cheshire

**Department of Highways and Transportation**

### ANALYST/PROGRAMMER
**SCALE 3/SO1 – £5640-£9660**

The Department seeks two programmers to join its Computer Services team. A system for planning and controlling the work of the County's direct labour organisation is nearing completion and is due to be augmented by facilities which will store and analyse information about the structure and performance of the County's roads.

The Department uses DEC VAX11/750 computers with a network of terminals within headquarters and in divisional offices throughout Cheshire. Programming is in ADMINS-U32, a modern high level development system.

Applicants will be trained in VAX and ADMINS. They should have an appropriate degree or equivalent qualification, linked with an interest in business systems as well as in the technical applications of the department.

**Application forms and further particulars *obtainable from The Personnel Section* Department of Highways and Transportation, Cheshire County Council, Backford Hall, Nr Chester. Telephone Chester 59208.**

**Closing date 9th September, 1983.**

(5180)

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OXFORD POLYTECHNIC

### DEPARTMENT OF MATHEMATICS STATISTICS & COMPUTING

A number of Research Studentships are available, leading to M.Phil. (CNAA) in the area of Computer Graphics for Teaching Methods in Statistics and Computing using the Apollo Computer System.

Applicants should normally either have, or expect to obtain, a good honours degree in a computer-related subject. Further details of these studentships and other research in the Department are available from the Postgraduate Tutor.

Salary Scale Researcher A, starting point £4,347.

Applicants should state the project(s) of interest, include a curriculum vitae and the names of two referees and send the applications to: The Postgraduate Tutor, Department of Mathematics, Statistics and Computing, Oxford Polytechnic, Headington, Oxford OX3 0BP. Closing date 31st August, 1983.

(5087)

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## PROGRAMMER
### CENTRAL LONDON
### £7,578-£9,030
**(starting salary according to experience and qualifications)**

The LOCAL AUTHORITIES CONDITIONS OF SERVICE ADVISORY BOARD (LACSAB) wishes to recruit a young programmer or statistician to help design, process and analyse pay and manpower surveys; set up information retrieval systems; and provide general statistical advice. LACSAB has eight MB Winchester disc microcomputers linked by private line to a leading mainframe bureau (CDC & IBM).

We require a person with at least a second class honours degree. At least one year's programming experience is essential, as is a good knowledge of Fortran and statistics. Experience of standard statistical packages (e.g. SPSS, SIR) would be an advantage.

LACSAB advises local government on manpower matters; collects, analyses and circulates pay and manpower data; and provides the employers' secretariats to the national negotiating bodies which determine the pay and conditions of over two million employees.

**For further information and application form contact Mrs Carolyn O'Brien, Research Section, LACSAB, 41 Belgrave Square, London SW1X 8NZ. Telephone 01-235 6081 ext 208. Completed application forms should be returned to LACSAB by 9th September.**

(5121)

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FINANCE

### COMPUTER OPERATOR

Salary £5808-£6300 + 14% shift allowance and £183 local weighting. Reference number CP269.

Applications are invited from experienced IBM or NCR operators to join the operations team based at County Hall and working a 5-day, 2-shift rota with opportunity for paid weekend overtime working.

The County Council, an established NCR Criterion user, has recently installed an IBM 4341 using VM, DOS/VSE and CICS to provide the base for future computing requirements. The IBM 4341 supports a rapidly growing network of local and remote terminals and will form the centre of the office automation and information processing projects being developed.

Attractive working conditions in modern offices with good restaurant facilities.

Applications (no forms) giving full details of education and previous work experience, quoting the job reference number, together with the names and addresses of two referees, to The County Treasurer, County Hall, Hertford, by 31 August, 1983.

Hertfordshire County Council

(5122)

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Yorkshire Regional Health Authority

### REGIONAL COMPUTER CENTRE – HARROGATE

The RCC provides a comprehensive service to users in 18 Health Authorities and has a number of vacancies for qualified and experienced staff. A new computer centre is in operation working on an ICL 2966 with extensive communications capabilities together with various makes of micros/minis.

The computer applications cover a wide range of activities including medical, hospital administration and financial control, all of which may be provided on the above hardware.

### Senior Systems Designer/ Programmer
**(Scale 9) – Ref AC24**

A sound educational background together with three or more years' practical design experience and a total of at least six years' computing experience is needed.

Formal training in systems design and/or programming is desired and applicants must have proven capabilities in developing or writing large applications. A good knowledge of large mainframe mini or micro computers will also be necessary together with experience of programming in COBOL, BASIC or FORTRAN. Structured design is used in all areas of work.

### Systems Designer/ Programmer
**(Scale 4) – Ref AC25**

Both posts will cover the same type of work as the Senior Systems Designer/Programmer although at a lower level. The requirements however are for similarly educated people with at least two years' practical experience excluding training and the ability to design and program (ie using COBOL, BASIC or FORTRAN) major programs or sections of systems.

***Salary Scales***

*Scale 9 £8367-£10,277 pa plus Proficiency Allowances*

*Sale 4 £7404-£9025 pa plus Proficiency Allowance*

**Application forms and job descriptions are available from the Regional Personnel Officer, YRHA, Park Parade, Harrogate HG1 5AH. Telephone: (0423) 65061 ext 108/109.**

**Please quote the appropriate reference number.**

**Closing date: 9 September 1983**

(5171)

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UNIVERSITY OF NEWCASTLE UPON TYNE

### PROGRAMMER

The University Administration requires a programmer to fill a newly-established position within its Data Processing Unit.

The Administration has a SYSTIME 6400 (PDP11/44) mini-computer operating under RSTS/E using BASIC-PLUS as the programming language.

This appointment will follow further consolidation of an already extensive number of on-line interactive systems concerned with financial, staff and student records.

Applicants should ideally have experience of a similar computing environment.

The appointment will commence as soon as possible and the salary will be at the appropriate point on the Administrative Grade 1A scale: £8,310-£11,615 p.a., according to age, qualifications and experience.

Further particulars may be obtained from the Deputy register (F.P.), The University, 6 Kensington Terrace, Newcastle upon Tyne NE1 7RU, with whom applications (2 copies) together with the names and addresses of three persons to whom reference may be made, should be lodged not later than 23rd September, 1983.

(5149)

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### PART-TIME LECTURERS IN COMPUTING

To teach data processing, systems analysis and other areas on various courses commencing late September at the Polytechnic's Hendon location, including BCS Part 1, BTEC and HNC Computer Studies.

**Please write with c.v. and details of availability to: Allen Findlay, Head of School of Mathematics, Middlesex Polytechnic, Queensway, Enfield, Middlesex EN3 4SF.**

(5172)

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University of London
DEPARTMENT OF EXTRA-MURAL STUDIES

**BASIC Programming and the RML 380Z !**

Two courses of six meetings beginning 13th October and 24th November at 6.30pm.

BASIC Programming and the RML 380Z II.

One course of six meetings beginning 2nd February at 6.30pm.

For further details and application form please contact Mrs S. Johnston, Department of Extra-Mural Studies, 26 Russell Square, London WC1. 01-636 8000 ext. 3075.

Please quote reference MCL.

(5046)

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DISTRICT TREASURER'S DEPARTMENT

### Senior Analyst/Programmer
**Salary on Grade PO1 (1-5) – £9945-£11052 per annum + £270 London Weighting**

Applications are invited for this newly created post within the computer section of the Treasurer's Department. The Council is in the process of obtaining a Honeywell DPS 6/76 and is a member of a consortium of eight districts linked to the DPS 8/52 Honeywell mainframe of Essex County Council.

It is likely that the successful applicant will have had at least 3 years' programming experience complimented by a year of system analysis. Though not essential experience of Honeywell DPS 6 installations including TPS and or Screenwrite would be an advantage.

Situated in the south of Essex, the district incorporates the major portion of Epping Forest and is served by the M11 and M25 as well as offering Central Line access to the heart of London.

Housing and relocation expenses will be considered in appropriate cases.

**Application form and job description may be obtained from District Personnel Officer, 323 High Street, Epping, Essex CM16 4BZ. Telephone Epping 77344. Ext. 201.**

**Closing date: 7th September 1983**

**Please quote T/24B**

Epping Forest District Council

(5184)

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### Programmer
**Salary £8337-£8895 per annum inclusive (Scale 6)**

Applicants should have been employed for a minimum of one year as a COBOL Programmer preferably in a VME environment. It is also desirable that he/she has experience of I.D.M.S. as the postholder will take part in the development of database projects.

Where applicable training will be given. Benefits include:

★ Staff Productivity Scheme
★ Flexible system of working hours
★ Housing accommodation if appropriate and/or Relocation expenses paid.

**Job details and application forms are available from the Management Services Officer, Council Offices, The Campus Welwyn Garden City, Herts AL8 6AE. Tel: WGC 31212 Ext 413.**
**Closing date Friday, 2 September, 1983**

Welwyn Hatfield District Council

(5170)

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POLICE COMPUTING

### SYSTEMS PROGRAMMER
**SO1/2 – £9,060-£10,539 p.a.**

To work chiefly on the operational systems of the computer project branch based at Force Headquarters in Stretford, Manchester.

The Greater Manchester Police is one of the largest forces in the country with a comprehensive programme of computerisation. It is currently developing a number of major systems which will play a significant part in assisting the operational and administrative efficiency of the force. These include a data network linking headquarters to divisions and sub-divisions, message switching, criminal records, personnel, stock control, central ticket office, word processing and other office systems. Other applications planned for the future include command and control, street index and an interface to the Police National Computer.

Applicants should have experience of large on-line applications and have been a shift leader or equivalent.

For an informal discussion phone Mr Softley, Deputy Project Leader, on 061-798 9857 ext. 303.

Application form and further details available from Departmental Management, County Treasury, County Hall, Piccadilly Gardens, Manchester.

Closing date: 2nd September.

The Greater Manchester Council is an Equal Opportunity Employer.

(5083)

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### DP SUPERVISOR
**£10,500 BASIC + 15% Bonus**

Our client, INMAC are shortly to open their WEST LONDON Distribution Centre and need an experienced person to manage new Data General equipment. Candidates in their late 20s must possess the appropriate skills

**Please apply to Peter Barnett quoting CW/8289 at Barnett Consulting Group Ltd., Providence House, River Street, Windsor, Berkshire SL4 1QT. Tel: Windsor (07535) 56723**

(5119)

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ROXBURGH DISTRICT COUNCIL
FINANCE DEPARTMENT

### SYSTEMS ANALYST/ PROGRAMMER

Applications are invited for this newly created post from persons with some years' experience and a knowledge of BASIC. The installation is a Microdata Reality, with 128K memory and 100 Mb fixed disc.

The salary scale for the post is National Joint Council AP11/111 (£6,618-£8,184) with placing on the scale in accordance with qualifications and experience. The appointment will be for 2 years in the first instance.

Further particulars and application forms can be obtained from the Personnel Office, Roxburgh District Council, District Council Offices, High Street, Hawick TD9 9EF. Telephone 0450 75891. Closing date for the applications is Thursday, September 15, 1983.

(5183)

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# CONTRACTS

| | |
|---|---|
| IBM SYSTEM 34 RPG II ANAL/PROG. | LONDON |
| IBM COBOL IMS DB/DC ANAL/PROGS. | SURREY |
| DEC DIBOL C.T.S. 500 ANAL/PROGS. | KENT |
| VAX/VMS DIBOL SENIOR ANAL/PROG. | LONDON |
| ADF PROGS. | SURREY |

*For further details contact NIC POLAND TLP*

(5181)

TLP

**A division of Tate & Lyle Industries Ltd. Leon House, High Street, Croydon CR9 3NH**

*A member of the Tate & Lyle PLC Group*

Telephone 01-686 5656

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## REAL TIME SOFTWARE SPECIALISTS
### £8K-£20K

You may have as little as 2 years experience, providing that experience is concentrated in one particular field of computing. Of course, if you have several years experience you may have in-depth knowledge in more than one area of application. The point we must stress is that our clients who are users, computer manufacturers, consultants and systems houses, seek specialists not dabblers.

**Locations are:** London, Home Counties, other parts of England, Scotland and overseas too.

**Status:** All levels from Programmers, Software Engineers/Designers up to Principal Consultants and Managers.

**Areas of applications in which we seek specialists are:** Communications (all manner of), Communications Protocols, Data Acquisition, Process Control, Command & Control, Intelligence Systems, Databases, Compiler Design, Software Tools, Operating Systems, UNIX, ADA, Military and Defence Systems, Simulation, Image Processing, Expert Systems, EPOS, Mascot, Context, CAD/CAM Systems.

We are particularly interested in those experienced with PDP/11s, VAX, Argus, Data General, Intel, Motorola, using ASSEMBLER, CORAL, PASCAL, RTL/2, FORTRAN.

If you are educated to degree level and have specialised, perhaps in a field we have not mentioned, please contact Beryl McLaren, any hour of the 24, you'll get a personal reply, not a recorded message.

**01-836 9719**

P.S. We may be able to assist this years graduates who have 1st class honours degrees.

Jupiter Computer Appointments

**Specialist recruitment of Industrial, Scientific, Defence and Technical personnel**

12-13 Henrietta Street, London WC2

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# Systems Consultants

**Southern Rural County to £16,000 + car scheme**

Our client provides a comprehensive range of products and services to industrial companies throughout Europe. Products include:–

- Accounting Systems
- CAD/CAM
- Business Consultancy
- Manufacturing Packages

There is continuous development and consultants with strong manufacturing or accounting package experience are required to be instrumental in realising planned growth targets.

Candidates must be high-achieving, confidence inspiring managers who can communicate effectively at all levels.

Salaries and benefits reflect the importance of these positions and successful candidates will enjoy the support of an internationally recognised organisation.

**Please contact Brian Postles.**

**CADsearch, London House, 271-273 King Street, London W6 9LZ. Telephone: 01-741 8011**

CADsearch

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# Data Processing Controller
## Manufacturing Environment
## £9,000–£10,000

Walter Howard Designs Ltd.

This isn't a job for everyone, because working with our client you get to do it all. At least in the early days.

They make and design furniture. And they're very good at it. Sales are around the £5,000,000 mark, they employ ninety people, and they're growing.

The company's partly computerised and aiming to go all the way. The existing installation is an ICL System 10 Mini. It handles sales order processing, sales ledger, dispatch scheduling, inventory control and costing. Over the next couple of years, with your help and advice, they'll be installing a more powerful computer to handle these and other systems like material requirements planning, production control and an integrated financial ledgers system.

You'll have a VDU operator reporting to you and that's it for the moment. You're the computer operater, you run the department and make sure management has the information it needs. You'll also be responsible for the implementation of these new systems.

It's an important job and likely to get much more so. They need someone who can grow with the company and work under pressure.

You will probably be between 25 and 38.

You must be prepared to knuckle down to the nitty gritty and have the ability to expand the department in line with their growth.

**Think you could handle it? Then telephone Amanda Dean on 01-549 9236 (24 hour answering service)**

Sloangate Recruitment Advertising Limited
Dominic House, 171-177 London Road, Kingston-upon-Thames, Surrey KT2 6RA. Telephone 01-549 9236

(5084)

Sloangate Recruitment Advertising

## CROSSWORD

Solution to Prize Crossword No 43

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This month's £10 first prize goes to Frank Barber, a systems programmer with Lyons Bakery in Carlton, near Barnsley. Prizes of £5 each are being sent to David Allen, analyst/programmer with Vallances in Leeds, and Tyrell Brockbank, chairman of OTEC in Durham.


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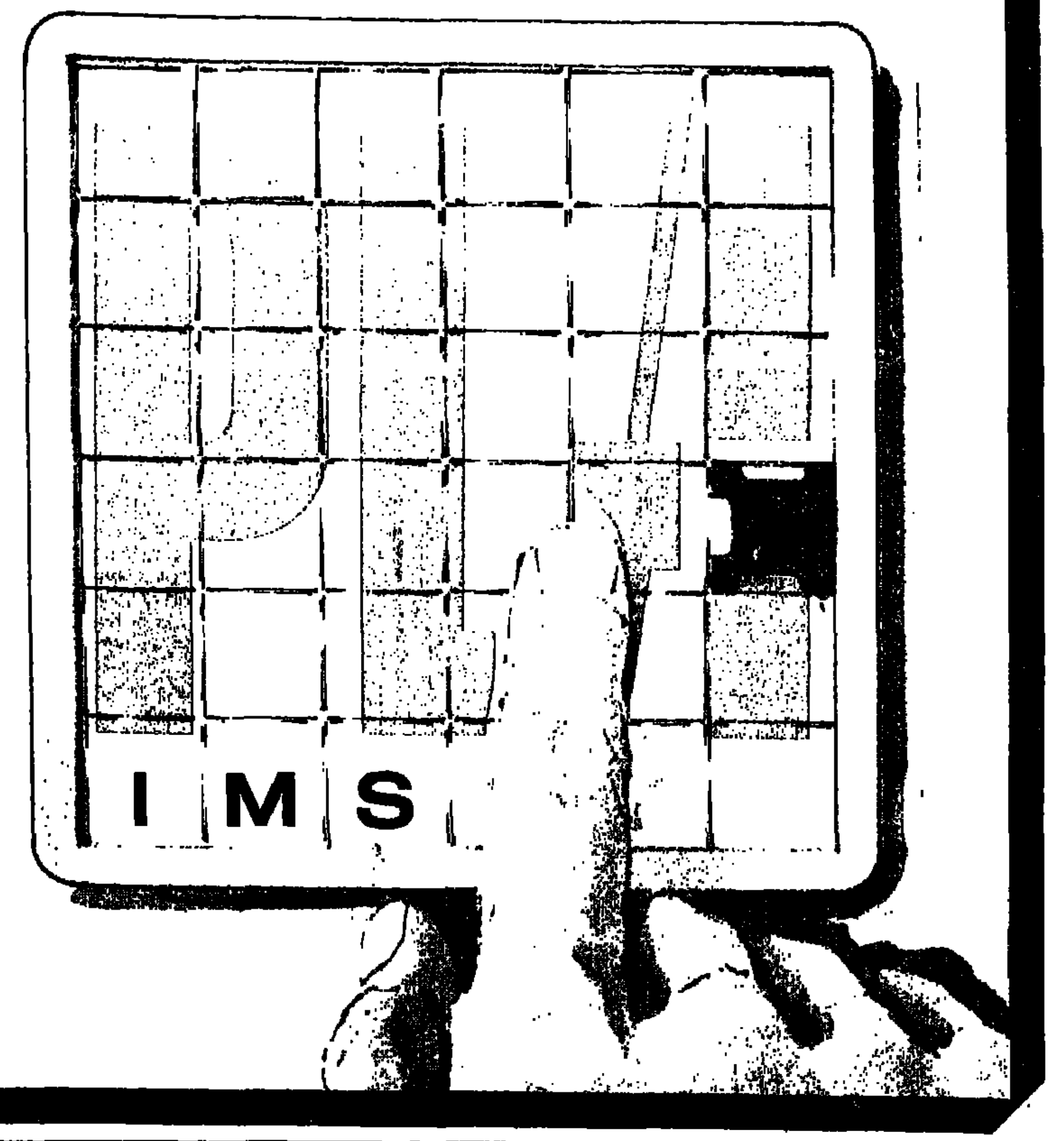


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